THE METAL INDUSTRY

WITH WHICH ARE INCORPORATED THE ALUMINUM WORLD, THE BRASS FOUNDER AND FINISHER AND ELECTRO-PLATERS REVIEW.

A TRADE JOURNAL RELATING TO THE NON-FERROUS METALS AND ALLOYS.

OLD SERIES
VOL. XI., NO. 9.

NEW YORK, SEPTEMBER, 1905.

NEW SERIES
VOL. III., NO. 9.

THE METAL INDUSTRY
AND
THE ALUMINUM WORLD
AND
THE BRASS FOUNDER AND FINISHER
AND
ELECTRO PLATERS REVIEW

PUBLISHED MONTHLY BY

The Metal Industry Publishing Company

(Incorporated)

61 BEEKMAN STREET, NEW YORK

PALMER H. LANGDON, ... *Publisher*
GEORGE P. SCHOLL . . . . . *Editor*
JOHN B. WOODWARD, ... *Director*

Subscription Price $1.00 per year, postpaid to any part of the world. Single copies, 10 cents.

ADVERTISING RATES ON APPLICATION.

ENTERED FEBRUARY 10, 1903, AT NEW YORK, N. Y., AS SECOND CLASS MATTER UNDER ACT OF CONGRESS MARCH 3, 1879.

CONTENTS.

THE CURRENT STRENGTH IN PLATING.

As the art of plating emerges more and more from the old-fashioned rule of thumb and is put upon a more scientific basis by the use of electrical current measuring instruments, electroplaters are forced to become familiar with the fundamental units of electrical measurements. These, while simple in themselves, yet seem very hard to understand to persons not familiar with them. As explained previously in THE METAL INDUSTRY, they are the volt, which expresses the electromotive force, sometimes called pressure or tension, between the electrodes; the ampere, which expresses the current strength on the volume of the current flowing in the conductor and through the bath, and the ohm, which expresses the resistance of the circuit and the bath. A mistake commonly made among platers is to call the voltage the current strength, as is, for instance, shown in the following expression which one frequently hears: "I have used a current strength of so and so many, say 4, volts." An expression of this kind does not mean anything, as far as the amount of deposited metal to be obtained is concerned, because the latter depends entirely upon the number of amperes, or the current strength, rightly so-called, flowing in the bath. With 4 volts, however, an entirely different current strength or amperage will be obtained in different baths, according to their resistance to the passage of the current. This resistance is determined by many factors, such as the concentration of the bath, that is the greater or lesser amount of metallic compounds dissolved in it; the relative surface of the anode and kathode and their distance from each other, the temperature of the bath, etc. Consequently with 4 volts electro-motive force between the electrodes, all other conditions being the same, a greater current strength or amperage will be obtained in a highly concentrated copper plating solution than in a weak solution of zinc sulphate for cold galvanizing purposes. Assuming for the sake of calculation the ohmic resistance in a bath of the first kind to be 0.02 ohms, then the current strength in amperes which would flow through the bath would be $\frac{4}{0.02} = 200$ amperes. In the second case we will assume the resistance of the bath to the passage of the current to be much

higher, say 0.25 ohms. The amperage flowing in that case through the bath will be only $\frac{4}{0.25} = 16$ amperes. These figures are, of course, only hypothetical, but they serve to illustrate the principle. It is therefore clear that the expression, "a current strength of 4 volts" is not only wrong from the electrical standpoint, but that it does not mean anything as a guide to other persons for the proper performance of a plating operation, unless it is accompanied by supplementary data. Chief among the latter is the current density, namely the amount of amperes to be used per unit surface, such as the square foot of the electrodes.

THE INFLUENCE OF LEAD ON THE MECHANICAL PROPERTIES OF BRASS.

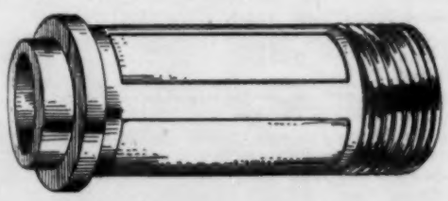
The addition of lead to the ordinary brasses is commonly practiced, not exclusively from the standpoint of cheapening the product by the introduction of a less costly metal, but also because such an addition imparts to the alloy better working properties. It is, however, easy to carry the percentage of lead in the alloy too far, for instance, by the use of miscellaneous scrap, as many a brass founder has found out to his sorrow when he examined his castings. Owing to the importance of this matter a recent series of tests made in France by Mr. L. Guillet, for the purpose of determining by microscopical and mechanical tests the exact influence of lead on the properties of brass, is therefore of considerable interest. The tests were made on cast bars as well as on forged and annealed bars. In the first series of the cast bars he started with an alloy containing 60% copper and 40% zinc, without lead, which showed a tensile strength of 45,370 pounds, an elastic limit of 11,520 pounds, an elongation of 47% and a resistance to shocks of 12 units. The gradual addition of lead up to 3% did not affect the tensile strength and elastic limit very much, while the elongation diminished to 12.5% and the resistance to shocks to 5. In another series of tests an alloy with 67.2% copper, 29.6% zinc and 3.2% lead, showed a much reduced strength compared with the starting alloy of 70.4% copper and 29.6% zinc, without lead. The forged and annealed bars also showed a decided loss of strength after their lead contents were higher than 3.05%. The microscopical investigation showed that the lead, inasmuch as it does not alloy with the brass, subdivides more and more, as its quantity increases, the characteristic crystals of the forgeable brass alloy, and thus diminishes the strength of the resulting alloy. Mr. Guillet concludes from his investigations that the lead interferes seriously with the mechanical properties of the brass alloys, especially when it is present in excess of 3%. The above remarks apply, of course, only to such alloys which do not contain any other metals than copper, zinc and lead. When other metals are present, as in certain special bronzes, the results would presumably be quite different.

THE WORLD'S PRODUCTION AND CONSUMPTION OF TIN.

Supplementing the editorial on American Tin in the August, 1905, issue of THE METAL INDUSTRY, the following figures relating to the production and consumption of tin will prove interesting. As given by U. S. Consul Williams, of Cardiff, Wales (U. S. Consular Reports), the world output of tin for 1904 was as follows: Malay States, 58,657 tons; Banca and Billiton, 14,638 tons; Bolivia, 9,200 tons; England, 4,282 tons; Australia, 5,082 tons, and miscellaneous countries, 384 tons, thus making a total of 92,243 tons. This shows a slight falling off in the production as compared with 1903, in which vear it was 93,893 tons, and is due principally to the decline of the production in Banca and Billiton, which district produced only 14,638 tons in 1904, as compared with 20,000 tons in 1903. There is little doubt that unless new deposits are opened up the production from this source will still further decrease. On the other hand, the consumption of tin is increasing, as is shown by the following estimate of the consumption for 1904: United States, 38,000 tons; Great Britain, 15,898 tons; Germany, 14,832 tons, and all other countries, 25,525 tons. The consumption was therefore 2,512 tons in excess of the production. It is not to be wondered at that in the face of this condition strenuous efforts have been made and continue to be made, in order to utilize the tin scrap and to recover the tin from it. Unfortunately this is a very difficult question, inasmuch as tin is a very difficult metal to deal with by electrolytic methods. As it is, a fair measure of success has been obtained by the few works occupying themselves with the utilization of scrap, and it is to be hoped that the question will be entirely solved in the not far distant future, and another one of the waste products, that were previously lost, be turned to a profitable account.

STOLEN NEW BRASS IN BRASS SCRAP.

The adjoining illustration shows a little brass part of which a quantity had been found in scrap brass recently purchased by one of the members of the Chicago Brass Manufacturers' Association. The nature of the part indicates that it has been stolen and disposed of through junk dealers. The information was sent to THE METAL INDUSTRY by Mr. William M. Webster, the commissioner of the Chicago Brass Manufacturers 'Association and he



asked us to give the matter space in our columns in order to locate the rightful owner of the parts. In addition he suggests to all parties who purchase metals, that they instruct their receiving department to report to the office promptly any articles or parts of brass that may look as though they might be new goods or which in any way bear indications of being stolen, so that the owner of them might be located.

CORROSION OF BRASS AND BRONZE BY MINE WATER.

By Jesse Jones.

It is the general impression that a high lead content is requisite for an acid-resisting metal. Results obtained in a series of tests made some time since indicate that the presence of lead is not a necessity and also that certain so-called "non-corrosive" bronzes are more subject to corrosion than some of the time-honored brass foundry mixes that have never been advertised as "non-corrosive." The tests referred to were made with the assistance of Mr. George B. Hadesty, Division Superintendent of the Lehigh & Wilkesbarre Coal Company, at the mines of the company located near Audenried, Carbon County, Pa. The water of these mines is said by manufacturers of mining pumps to be the most corrosive of any found in the United States, with the possible exception of that from the copper mines at Butte, Montana.

The samples were placed in the mine water on August 10, 1900, and taken out about August 10, 1901. They were placed in stout oak boxes perforated with numerous holes, to allow free access of the water, and rested on small blocks of close grained cast iron, the idea being to make the test more severe by the galvanic action due to the iron. The conditions were fairly satisfactory throughout the year, although there were times when the boxes filled with sediment. The manganese bronze specimens were placed in Number 11 Sump, the other specimens in Number 7 Sump.

The analyses of the water are given by Mr. Hadesty as follows:

No. 7 Sump—Oxides of iron and alumina, 29.15; combined sulphuric acid, 49.90; free sulphuric acid, 12.58; total sulphuric acid, 62.48. No. 11 Sump—Oxides of iron and alumina, 6.70 grains per gallon; combined sulphuric acid, 11.60 do.; free sulphuric acid, 21.25 do.; total sulphuric acid, 32.85 do.

After removal from the water the brass and bronze specimens were cleaned from adhering sediment and the loss determined by reweighing. In the case of the cast iron blocks, the corroded portions, consisting of the graphite, iron oxide, etc., were removed by means of the sand-blast. The specimens were not cast specially for the experiment, but were machined from gates and risers taken from castings that were being made commercially in every day routine foundry work. Several of the castings were quite large, at least two of them weighing in the neighborhood of ten thousand pounds each. A certain amount of gates and remelt was used in several of the castings, which accounts for the analyses varying somewhat from the percentage composition given for the mixtures.

MANGANESE BRONZE, CAST.

Two specimens were tested, the first being a rectangular block 1.60″ x 1.28″ x 1.05″, which weighed 301 grams and had been cut from a pouring gate. It lost 19.2 grams or 6.37 per cent. The other specimen was a tensile test piece 0.505″ in diameter, weighing 564 grams and it lost 19 grams or 3.37 per cent. After being weighed, it was broken in the testing machine in the usual manner. The original test on the castings, made from a similar coupon, is given for comparison:

Corrode Sample—Tensile strength, 57,530 lbs.; elastic limit, 27,951 lbs.; elongation in 2″, 31.0 per cent.; reduction of area, 30.7 per cent. Original Sample—Tensile strength, 59,291 lbs.; elastic limit, 27,483 lbs.; elongation in 2″, 33.0 per cent.; reduction of area, 27.3 per cent.

The mine water evidently did not seriously affect the strength of the test piece, the corrosion being entirely superficial. That the rectangular block lost more than the test piece is due no doubt to the fact that it is customary to attach chill blocks to the test coupons, this being a more convenient way of feeding the test piece than the use of risers. The finer grain resulting from the chilling enabled the test piece to resist the corrosion better than the rectangular block.

The manganese bronze had a specific gravity of 8.342 The chemical analysis showed the following composition:

Aluminum, 0.10%; copper, 57.20%; iron, 1.33%; lead, 0.02%; manganese, 0.03%; tin, 1.18%; zinc, 40.14%.

While the manganese bronze did not sustain its reputation as a non-corrosive metal in the case of the mine water, it is certainly non-corrosive as far as sea water is concerned. The writer at one time carefully examined a dozen large propeller blades weighing about nine thousand pounds each, which had been in continuous use for a period of six years in the trans-Atlantic service. They weighed the same as the day they left the machine shop and even the thin edges of the blades showed the marks of the cold chisels that had been used in cutting off the fins.

MANGANESE BRONZE, ROLLED.

This specimen was cylindrical in shape, being 2.54″ long by 1.08″ in diameter and weighed 321 grams. It lost 14 grams or 4.36 per cent. The specific gravity was 8.42. The physical characteristics were as follows:

Tensile strength, 69,295 lbs.; elastic limit, 34,377 lbs.; elongation in 2″, 25.5%; reduction of area, 24.3%. The chemical analysis showed the following composition: Copper, 62.45%; iron, 0.84%; lead, 0.06%; manganese, 0.02%; tin, 0.63%; zinc, 36.00%.

MUNTZ METAL, ROLLED.

This specimen was cylindrical in shape, being 2.47″ long by 0.9″ diameter and weighed 218 grams. It lost 4 grams or 1.83 per cent. The specific gravity was 8.472. The physical characteristics were:

Tensile strength, 74,209 lbs.; elastic limit, 31,953 lbs.; elongation in 2″, 21.5%; reduction of area, 41.0%. The chemical analysis showed the following composition: Copper, 57.55%; iron, .38%; lead, .56%; tin, 1.49%; zinc, 40.02%.

COPPER AND TIN. (Copper, 5, tin 1.)

This specimen measured 1.71″ x 0.99″ x 0.82″ and weighed 198 grams. It lost 4 grams or 2 per cent. The specific gravity was 8.731. No tensile test was made on this casting. The analysis showed: Copper, 82.30%; tin, 17.70%.

The loss on this specimen seems to be greater than its composition would warrant, and was probably due to the fact that the mixture was not remelted. A second melting nearly always gives a finer grain and more homogeneous structure.

RED BRASS. (Copper 100, tin 10, lead 10, zinc 4.)

This sample was a cylinder 2.55″ long and 1.46″ in diameter. It weighed 598 grams and lost 4 grams or 0.7 per cent. The specific gravity was 8.553. The chemical analysis showed the following composition:

Copper, 80.75% ; iron, 0.05% ; lead, 8.74% ; tin, 8.73% ; zinc, 1.73%.

The casting from which the above was taken was a condenser weighing ten thousand pounds. The copper was melted in the cupola and the white metals added subsequently. The unusual amount of lead was added to reduce the shrinkage of the metal and avoid cracking the casting.

HYDRAULIC METAL. (Copper 100, tin 10, yellow brass 25.)

This sample was 2.43" x 1.42" x 0.6", weighed 392 grams and lost 2 grams or .58 per cent. The specific gravity was 8.432. The physical characteristics were as follows:

Tensile strength, 25,700 lbs.; elastic limit, 16,540 lbs.; elongation in 2", 11.5% ; reduction of area, 14.0%. The analysis was as follows: Copper, 83.05% ; lead, .10% ; tin, 10.81% ; zinc, 6.00%.

Hydraulic metal is always poured into ingots after mixing and then remelted before pouring into castings. This gives the metal the dense, uniform structure which enables it to resist the action of the acid in the mine water.

The block of cast iron upon which the manganese bronze specimens rested, weighed originally 971 grams. It lost 221 grams or 22.76 per cent. The other samples rested on a block of cast iron weighing 945 grams. It lost 403 grams or 42.64 per cent.

A summary of the losses sustained by the above alloys follows:

Hydraulic metal, 0.58% ; red brass (leaded), 0.70% ; Muntz metal (rolled), 1.83% ; copper and tin, 2.00% ; manganese bronze, chilled, 3.37% ; manganese bronze, rolled, 4.36% ; manganese bronze, cast, 6.37%.

PLATING OF NICKEL UPON NICKEL.

The well-known difficulty of plating nickel upon nickel was made the subject of a paper before the American Electrochemical Society by R. C. Snowdon. He obtained a perfectly smooth and adherent deposit which could be burnished and scratch-brushed with impunity by connecting the nickel on which the deposit was to be made as cathode in an acid solution and passing a fairly large current for a short time. This will cause a heavy evolution of nascent hydrogen, which will reduce the oxide on the surface of the metal.

For the preliminary treatment of the nickel cathodes he prepared a 3-normal solution of hydrochloric acid and used a current density of 8 amperes per square decimeter. The electrodes were both of nickel and were placed about 4.25 centimeters apart. The treatment was continued for four minutes, hydrogen being given off freely at the cathode. As soon as sufficient treatment had been given to the cathode, it was washed in clean water and plunged into the regular plating solution made up of nickel ammonium sulphate 18 grams and water 1 liter.

This procedure gave a satisfactory and smooth deposit. In another experiment the nickel plate was simply scratched-brushed and cleaned and put in the same solution, but an adherent deposit could not be obtained. The author concludes, that nickel cannot be successfully plated on other nickel on account of the presence of a thin cover of oxide, which cannot be removed except by rigorous reduction.

Alaska is the largest producer of placer gold in the United States, the output for 1904 being estimated to have a value of $5,800,000.

PRODUCTION AND USE OF BISMUTH.

The metal Bismuth alloys with certain metals, the resulting alloys melting at low temperature. Its principal alloys are with lead, tin and cadmium, singly and together, in varying proportions according to the use to which the alloy is to be put. The melting point of the various alloys in use range from 140° F. to 202° F. They are used as safety fuses for electrical apparatus, safety plugs for steam boilers and automatic fire extinguishers, solders and dental amolgams, matrices for plaster or wax casts, etc. The alloys are also used for baths in certain operations which require liquids to be kept at a definite temperature below the boiling point of water.

According to E. N. Hovey, in a recent bulletin issued by the U. S. Geological Survey, the demand for metallic bismuth and bismuth salts is small, but the quantity of metal which could be placed upon the market is relatively large. During the last year the war in Asia has increased somewhat the demand for some of the salts of bismuth used medicinally and for surgical purposes. The extraction of bismuth from its ores is a complex process, however, and both production and prices are controlled by Johnson, Matthey & Co. (Limited), of England, and the Government of Saxony.

The marketed production of bismuth ore in the United States in 1904 was 5,184 pounds, valued at $314. No sales were reported in 1903 or 1902. A total of about 83 short tons of crude bismuth ore is reported as having been mined but not sold during 1904. The price of refined metal is kept so low by the combination controlling the business that profitable mining of our domestic ores is practically out of the question. The imports of metallic bismuth into the United States during 1904 were 185,905 pounds, values at $339,$58, as compared with 147,295 pounds, valued at $235,199, in 1903, with 190,837 pounds, valued at $213,704, in 1902, and with 165,182 pounds, valued at $239,061, in 1901. A small quantity of bismuth salts is imported also for chemical and pharmaceutical purposes.

A GERMAN COPPER ROLLING WORKS.

The equipment of the Osnabrucker Kupfer und Drahtwerke of Osnabruck, Germany, as stated by A. Westman in Pinkonterets Annales, comprises two rolling mill trains with two rolls each. The first rolls have a width of about 59 inches and the finishing rolls about 78 inches. As the train is not reversing, the plates have to be moved back over the rolls by means of lifting tables after each passage through the rolls. For this reason rolling goes along very slowly. The heating furnace is a reverberatory furnace with two fire-places, both situated at the front of the furnace, one on each side of the charging door. The heating gases enter directly under the arch by means of a number of openings. The blocks are first rolled down 2.95 inches thickness and are then carefully examined and any imperfection, slags, etc., removed by hand. The bars thus cleaned are rolled into sheets. The plant is also equipped with a wire rolling mill which contains a preliminary mill for two trains, and a wire rolling mill with seven trains. The latter makes 400 revolutions in a minute. The copper wire is rolled down to 6 to 7 milliometers diameter.

The specific gravity of cast zinc when poured at or near its melting point and cooled slowly is about 7.125. By rolling, the specific gravity is increased to 7.2, and a cubic foot of rolled zinc weighs about 450 pounds.

THE BOWER-BARFF FINISH.

By H. J. Hawkins.

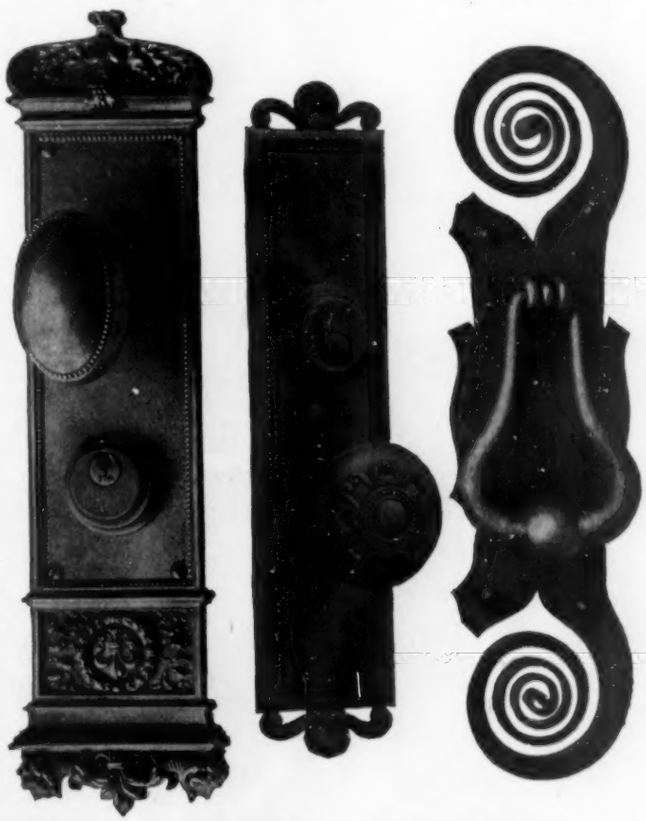
This finish is of French origin, having been invented and patented by two French experimentors and named after them. Their names were respectively Mr. Bower and Mr. Barff; hence the name "Bower-Barff," which has been and is now horribly mutilated as to its correct spelling and pronunciation. There are many cheap imitations of the genuine finish; some made by the use of a black oxidize, others by the use of black lacquers or dead black paint. The imitation finishes are used upon brass, copper or even soft metal goods, whereas the genuine Bower-Barff finish can only be applied to steel and iron goods.

Comparatively few persons, even those familiar with the general methods of making and finishing hardware goods, have the proper idea as to how the genuine Bower-Barff finish is produced. I presume the principal reason for this lack of definite knowledge is scarcity of the plants in this country. The entire West, I believe, boasts of only one plant for doing this work. This one is operated by a large hardware manufacturing company located near Chicago. How many of these plants are maintained by the hardware makers of the east I do not know, but I venture to say not more than four or five.

The first cost of installing the plant is considerable, running from $2,500 to $5,000, according to the size and capacity. When once put in operation the fires are never allowed to die out, unless for repairs to the furnaces or other unavoidable delays. When the fires are allowed to go out and the furnaces cool off, it takes several days to get the heat up to the proper temperature to do the work. Anthracite coal is used exclusively for heating, as it maintains a uniform heat and is free from smoke and soot. The firebox is separate and distinct from the furnace which receives the work to be finished. The firebox of a good sized plant is built of brick and is strengthened by a framework of iron, being about ten feet high and eight to ten feet wide. There is an ash pit below and the coal is fed from the top. The heat from the fire box passes through a labyrinth of flues into the furnace containing the work to be finished. The latter has about the same shape as the fire box, but is much larger, and is supplied with a large sliding door manipulated by weights; a steel track upon which an iron truck runs passes through this door into the furnace. The track is supplied with iron or steel bars or frames, upon which the work is suspended by iron hooks.

Before going into the Bower-Barff furnace the work is all sandblasted, which operation leaves it perfectly clean and with a good surface to take the finish. The work must be handled with even more care than in the plating operation as to cleanliness, as even a finger-mark upon the sandblasted article will not take the finish perfectly, showing plainly the spots caused by handling or otherwise. The work is hooked up with suitable iron hooks and placed upon the frame of the iron car, the pieces being adjusted in such a manner that they will not touch each other. This latter condition is imperative. Another peculiarity about the finish is that an electro deposit of any kind will not adhere to it. Thus copper, nickel, silver, or any other metal may be deposited upon a surface finished by the Bower-Barff process, but it will not adhere; it will peel off or raise up entirely.

When the iron truck is loaded with work, as much being put on as can be without touching, a clutch from the car is dropped on to a chain cable which passes into the furnace. The door raises and the car passes into the furnace, where it remains from three to four hours, depending upon the size of the work to be finished and the degree of heat being maintained. The heat is supposed to be kept at a certain temperature at all times, which is regulated by the operator. Little loop holes are made through the rear wall of the work furnace, through which the operator may observe the progress of the operation. When the work has been



THE BOWER-BARFF FINISH APPLIED TO BUILDERS' HARDWARE

in the furnace for the necessary length of time, it becomes a deep cherry red hue. Now, through an inch pipe properly connected through the rear wall of the furnace, a jet of live steam is turned into the furnace for fifteen minutes at a considerable pressure. The chemical action of the live steam in combination with the intense heat upon the red hot work is what brings out the thick scale or oxide upon the surface of the work. The latter is then removed from the furnace and, when sufficiently cool, is given a finishing coat of wax, which is brushed on and brings out the true Bower-Barff color, and gives the work a more finished appearance. Samples of work finished with the Bower-Barff process by the Yale & Towne Mfg. Co. are shown in the accompanying cuts.

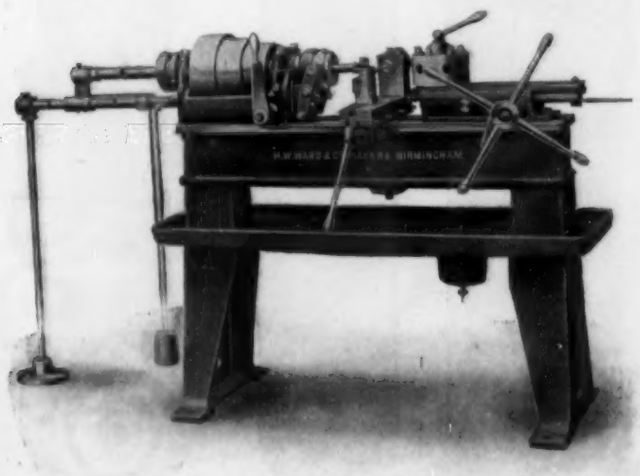
German papers state that it is a well-known fact that the presence of very small quantities of foreign substances is likely to change the qualities of metals and their alloys materially. Gold is no exception to this rule.

MECHANICAL ECONOMIES IN THE BIRMINGHAM BRASS TRADE.

By Our British Correspondent.

An important change in productive methods in the Birmingham brass trade has taken place within the last two years, namely the production of a large variety of small and useful articles in brass from the solid rod or bar instead of from the casting. The wire-feed compound Capstan lathe, by means of which this change is effected, has found its way into nearly all the leading shops. A number of these machines, operated by girls, are shown at the Arts and Industries Exhibition in Bingley Hall, Birmingham, and the rapidity and perfection of their work has caused general admiration. The principal feature of the lathe is the revolving turret, from which project horizontally various tools for drilling, boring, turning and screwing, and in addition there is a cross drill, which penetrates the metal at a right angle from the tool operated from the turret. The manipulation of the machine is simple, and the work can be done by boys or young women, making from ten to fifteen and sixteen shillings a week

The production from the solid by means of the



THE CAPSTAN LATHE.

Capstan lathe is only really profitable when a large quantity of a certain article has to be turned out, because of the expensive character of the tool equipment. Thus, for example, a single article involving a couple of machine fixtures, requires an outfit costing about £40. If only a small quantity were wanted the game would not be worth the candle, but where the demand runs into thousands, the production becomes very profitable indeed. In one respect the manufacturer is fortunate. There is a good demand for the swarf, or waste, which makes the use of the solid bar a perfectly safe speculation. Delta metal is the kind of brass most commonly employed, and, in fact, is quite the favorite metal. For most purposes it is universally preferred, as it works cleaner and altogether more evenly than brass. Purchased in the bar, it costs from 5⅝ to 6 pence halfpenny per pound. The swarf, or "chips," thrown off in the turning process, sells readily at 3¾d. per pound, so that the pure metal from which the article is made may be said to cost 2d or a little over per pound, according to quality. There is a good deal of waste, but one manufacturer confidently declares that he could throw away in chips 90 per cent. of his material and still come out with a substantial profit. It is, of course, very rare for the waste to come anywhere near this proportion, and manufacturers agree that where the waste reaches 50 per cent. the finished article is a very profitable commodity. Most brass manufacturers can utilize the swarf in their own foundry for the larger articles which cannot be produced from the solid rod. The limit of profitable production by the modern solid method seems to be reached at about two inches diameter.

The illustration shows a type of lathe most commonly in use in Birmingham. A very useful machine is the 6½ inch Capstan lathe, with auto-ball chuck and cross drilling attachment. On this machine a kind of cock, known as the pet cock, and a second called the drain cock, are very commonly turned out. The latter is made out of a brass bar, 1 1-16 inches thick, by a series of operations the whole of which occupy a minute. In this period the cock has been formed, screwed, drilled, cross drilled and finally cut off. There are three pedals, one of which puts the lathe in motion, a second starts the cross drill and applies a brake to the other part, while the third is used to reverse the entire motion of the lathe. The making of a cock-body from the bar is in itself a revolution of quite recent introduction. The effect of the ball chuck is to get a much larger capacity from the spindle.

An equally useful machine is the 7½ inch fractional geared Capstan lathe, commonly used for machining 1½ inch globe valves. In this the chucking, comprising twelve operations, occupies 3½ minutes. The taper plug for the cock body already mentioned is produced on the 5½ inch Capstan lathe. This requires six operations, comprising milling down the end of the plug for the nut, screwing, forming the head, milling the taper of the plug, cross-drilling and parting off. The whole of these is done in the short time of twenty-five seconds. By the simultaneous operation of four machines dealing with the body, the plug, the small handle over the plug, and the nut and washer, the entire operation is completed in 2½ minutes.

As a rule machines are fixed and run in the builders' own works, producing articles to the customers' satisfaction and in the guaranteed times before delivery. The pedal motions for operating the belts effect a considerable saving of time, as they leave the hands of the operator free for dealing with the chuck, Capstan and cut-off rest. The cross drill can be used in producing such articles as gas plugs, gas bodies, water tap plugs, cabinet brass fittings, small eye-bolts, tommy-headed screws, drilling, tapping hole in made-up gas elbows, etc., of which some are illustrated in the accompanying figure. Such important components as the plugging tool, the cutting-off tool and holder can, of course, be made suitable to the kind of tool to be employed, the cost of these parts varying from about £4 to £6.

The machines mentioned above the built by H. W. Ward & Co., the prices running as follows: 7½ inch (already mentioned), £121; 6½ inch, for dealing with 1¼ inch bar, £70; 5½ inch, £60; 4¼ inch (1½ inch wire feed), £42 10s.; 3 inch (⅜ inch wire feed), £38.

Importance is attached to the cross drill, which saves a transfer to a second machine, and the employment of an additional hand. A second firm, which deals with small machines mainly, is that of Timbrell & Wright, whose specialty is the rapidity of their mechanism. Their machine for dealing with a ⅝ inch

rod makes 3,000 revolutions per minute. They employ a kind of bearing which, owing to the peculiarity of the metal used, effectually prevents overheating.

VARIOUS PARTS MACHINED FROM THE ROD.

Owing to the requirements of the cycle, motor, electric and gas industries, the number of small articles required from the trade is constantly increasing, and nearly all of these can be made out of the solid.

BOUNTY ON LEAD IN BRITISH COLUMBIA.

According to U. S. Consul Smith, of Victoria, B. C., the bounty placed on lead in that country has given the industry great impetus. The total production of lead in British Columbia for the fiscal year ending June 30, 1905, is officially stated to be 55,752,019 pounds, or a little over 27,871 tons. For the year 1904 the total production was 18,323 tons; 1903, 9,044; 1902, 11,268; 1901, 25,791; 1900, 31,674. The figures tell of an industry which had dwindled to less than one-third of its top production in three years and which in two years more, through the bounty, has almost regained its old position. The product of the year is the best but one in any twelve months in the history of the Province.

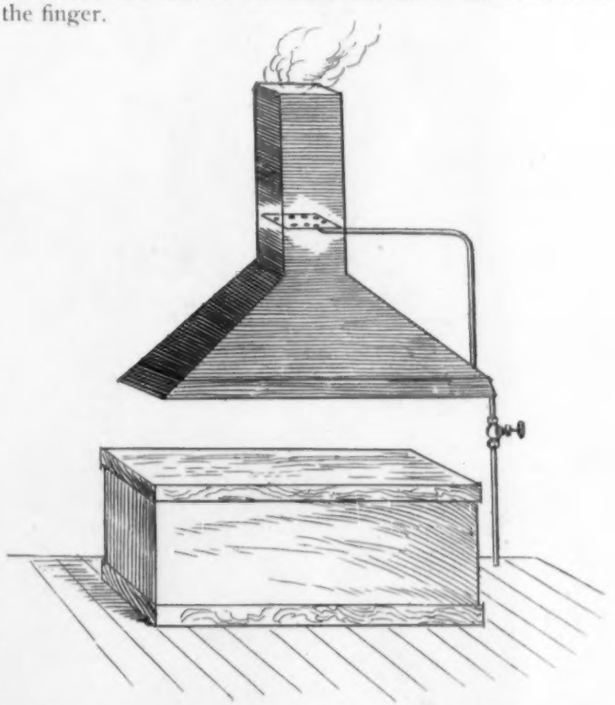
Of the 27,871 tons produced this year, 11,000 tons have been exported, while the remainder, nearly 17,000 tons, has been smelted in British Columbia. The rate of bounty paid varies with the London price, and is less for exported lead than for that treated locally, viz., $10 a ton in the first case, $15 in the second. It is roughly figured that the total amount of bounty paid will be about $340,000 out of the $500,000 set aside by the government for that purpose. The value of the total production of lead in British Columbia in 1904 is officially reported as amounting to $1,421,374, while the combined product of lead in all the other Provinces of Canada is given as $215,546.—(U. S. Consular Reports).

Lead is very soft when allowed to cool and solidify slowly. If cooled quickly it is harder, and thi sis the case when it contains slight admixtures of other metals, as copper, arsenic, antimony, zinc, etc. On this account the grade of commercial lead is often approximately determined by noting the resistance it offers when scratched with the finger nail and the ease with which it makes a gray streak on paper.

SOAP TANKS FOR PLATING PURPOSES.

By Charles H. Proctor.

Soap tanks are an absolute necessity in plating establishments. The solution usually kept in them is made up of common whale oil soap or, as it is commonly called, "plater's compound." The strength should not exceed one-half pound to the gallon, and it is absolutely necessary that the solution should be maintained at a low boil. Like all solutions, this has some disadvantages, inasmuch as by constant use, without entirely renewing it, it takes up material used in the polishing compositions, such as wax and oxide of iron. These materials develop a cloud on the polished surface when the solution is excessively dirty or when it is boiled too much. This cloudy effect shows itself after the lacquering or plating. The piece of polished work, after being boiled in such an excessively contaminated solution and polished in the usual manner and passed through the usual cyanide solution, will show the above mentioned cloud when it is taken to the light. The cloud can then be well seen and can be removed with the finger.

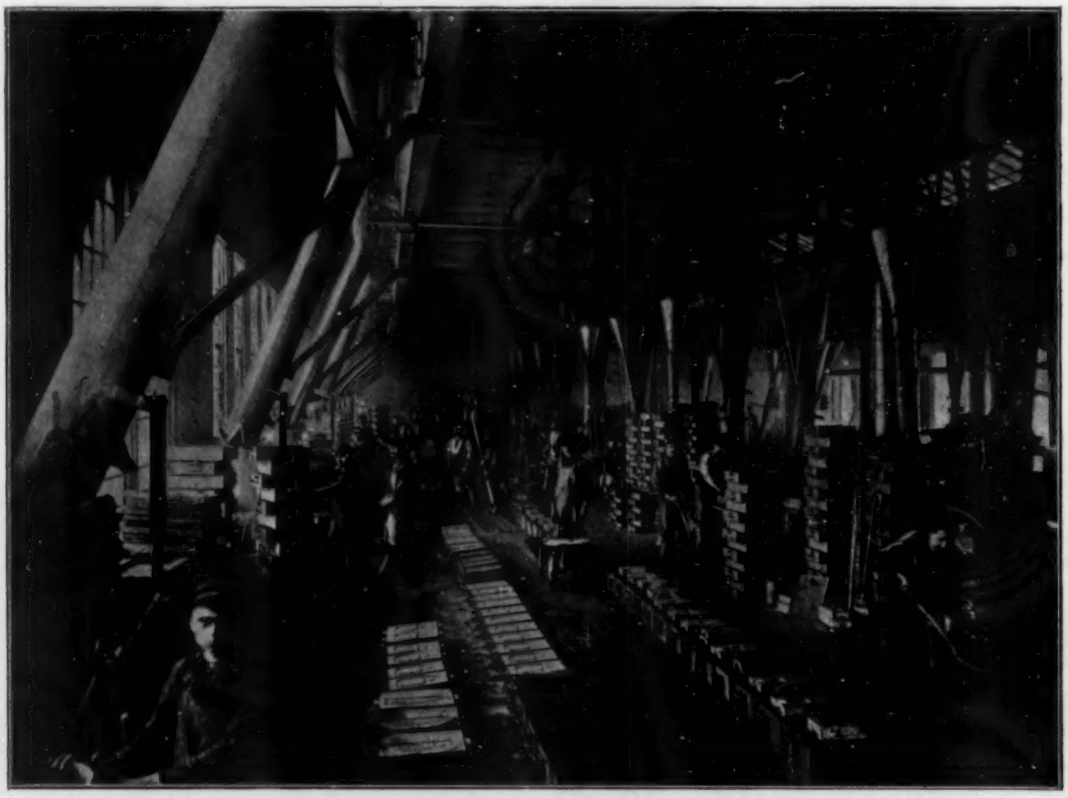


Various methods are used for carrying off the steam which arises from such tanks. One of the best methods consists in the use of exhaust steam, if the latter can be obtained. The hood should then be made of galvanized iron or any other material, and it should be large enough to extend the whole length of the tank with an excess of say six inches all around. This hood should come down as low as possible without causing inconvenience to the operator who works at the tanks. It should be built on an angle of 45 degrees to a center. The pipe or flume should be 10 or 12 feet above the hood, and should be either round or square, with a diameter of 12 inches. About two feet from the bottom of the flume there should be placed a coil of ¾-inch iron pipe with holes, drilled on an angle, ⅛-inch in diameter and two inches apart. The holes are so placed that the steam will converge from all sides to a common center. The ends of the coils are connected with a T and this again with the exhaust steam pipe. The valve can be placed anywhere, where it is convenient or handy. A small amount of steam insures a good draught. A general sketch of the arrangement is given in the accompanying illustration.

BRASS FOUNDRY OF THE WESTINGHOUSE ELECTRIC AND MANUFACTURING CO.

By W. J. Reardon.

The brass foundry of the Westinghouse Electric and Manufacturing Company, located at East Pittsburg, Pa., is one of the most up-to-date foundries in the United States, as it economizes in space and in labor-saving devices, and has been brought to as high a state of perfection in brass foundry practice as is possible. There is such an infinite variety of work, consisting of castings weighing from a fraction of an ounce up to 2,000 pounds, a great majority of them requiring an electrical as well as mechanical test, that it would be impossible to follow each and every operation in a limited article. I will therefore simply describe the equipment in a general way.



VIEW OF ONE OF THE AISLES.

The foundry is 300 feet long and 75 feet wide, on the second floor, laid off in three bays or aisles. The smelting department, which is located in one end, is equipped with four batteries of six furnaces, each capable of heating a No. 100 crucible, and two Schwartz furnaces heated by fuel oil. The mixing and weighing of the metal is done in the store room, located on the ground floor. All metals drawn from this store room are daily charged to the foundry by the mixer in charge of this department.

The west bay, or aisle, is devoted to power-ramming molding machines exclusively, the equipment consisting of twelve machines and a sand conveyor, that brings the sand to the operator through a spout located directly over each machine. By pulling a lever the operator releases as much sand as he may require for his mold. The mold, when finished, is laid on the floor beside a grating, ready for pouring. After being poured, the mold is dumped on the grating, through which the sand drops and is conveyed to a tempering machine on the mezzanine floor, after which process it is elevated and distributed to the various machines ready for service again. The pouring is done from a shank, supported by a trolley, which extends the full length of the bay, and which is equipped with a rotary air hoist for lifting the crucibles from the furnace. These hoists and trolleys dispense with a large percentage of hard labor. After the molds are dumped the castings are taken to the cleaning department, located at the upper end of the foundry, where they are brushed, chipped, rumbled and delivered to the shipping department. The cleaning department is also well equipped with labor-saving machinery such as large sprue-cutters, band-saws, brush-wheels, rumbling-barrels, floor-scales, etc., no expense having been spared in this department to equip it for getting out work quickly.

The center bay or aisle is laid out for floor molding and heavy power-ramming machines. Castings are made weighing from ½ pound up to 2,000 pounds, all in green sand. Castings weighing from 800 pounds to 1,200 pounds are the rule rather than the exception. Very large aluminum pieces are also made here successfully. This bay is equipped with a five-ton electric traveling crane, which does all the lifting of heavy copes as well as being used for pulling and pouring metal.

The east bay or aisle is devoted to bench molding and hand-ramming machines. On the benches is done principally the experimental work. The hand-ramming machines are used on work that has deeper lifts, and

where it is necessary to ram one part harder than another.

In this connection a description of the method of making patterns for these hand-ramming machines will be found interesting. If, for instance, it is intended to make a pattern to fit a 11 x 16 inch flask, a plate about 13 x 19 inches will be wanted, so as to allow room for the attachment of a vibrator. A fine facing sand is mixed, well rolled and stamped. Then a flask about 18 x 23 inches is secured, and the wooden pattern rammed up as if for regular casting. The next operation consists in cutting the gate for the pattern as it is to be worked on the machine. The flask is then raised by means of strips to a height equal to the desired thickness of the plate. A height of ¼ inch has been found sufficient for plates 11 x 16 inches. The interstices are then filled with sand. A wedge gate on each end of the plate has been found the best method of pouring. The alloy used for the pattern is poured into the mold and the pattern comes out in a plate which, with very little finish, is readily fitted to the machine and, if properly taken care of, will last a lifetime. It has been found unnecssary to have expensive stripping plates made for any of the work, and most of it is very difficult to make. By attaching a vibrator, it is possible to drop almost any pattern without the aid of a stripping plate or stool. In most cases, if any number of castings are to be made, a metal pattern will have to be procured any way, and it will not cost any more, and in most cases not so much, to fit a plate for the molding machine from which a better casting will be gotten and at the same time a largely increased production.

Duplicate receipts are made out for all castings sent from the foundry, and these have to be signed and returned for record. Thus from the requisitions on the store room through the mixer and the receipts from the shipper, the loss on melting and the stock can be ascertained every day, if desired.

PARTING COMPOUNDS AND THEIR USE.

By J. W. Scully.

It is well known to all founders and molders, both in iron and brass, that parting compounds or, as they are commonly known by the molder, "parting sand" are an important material, without the use of which the molder would have his own troubles. In order to make a good mold after ramming up one side of it, the parting sand is sprinkled on the side rammed up and blown off from the patterns in order to have them clean. Then the cope is put on the drag and rammed up in the usual way and, when lifted off from the drag, the mold parts at the desired point.

There are a number of materials used for parting, such as charcoal, white sand and a number of others. There has been placed recently upon the market a parting material known as "Lycodin." This material gives very good results and leaves the castings with a nice surface. The writer would recommend it to any one making a nice line of brass or iron castings, where a nice surface is required. The material is by far cheaper than Lycopodium and the results are fully as good.

With The Metal Industry are incorporated The Brass Founder and Finisher, The Electro-Platers' Review and The Aluminum World and Brass and Copper Industries.

ALUMINUM-BRONZE DIES.

By H. O. Winslow.

In regard to aluminum bronze dies for stamping sheet metal such as coffin plates, or anything in the line of britannia, sheet aluminum or sterling silver, there is an opportunity for manufacturers to save both money and time when compared with dies cut in steel. It is a well-known fact that there is nothing as good as a die cut in steel for metal as hard as sheet brass, where a finely embossed surface is desired, but for softer metals the aluminum bronze dies are just as good, and the expense is but a fraction of the cost of steel.

In all cases where a steel die is made, an aluminum bronze force is as good as a steel force. Edward Miller & Co., of Meriden, Conn., manufacturers of lamps, gas and electrical lighting goods, are using aluminum bronze forces, and have been using them for 25 years with success, as evidenced by the quality of work turned out in their large establishment. The cost of making such a force is very small as compared with steel.

The writer has made forces in aluminum bronze for striking drawer pull backs, with a lion's head raised ¾ of an inch high in sheet brass finely embossed, and after striking 10,000 dozen, the force was apparently as good as new. The patterns for these dies and forces are made as follows: A pattern of the article required is first chased nicely in sheet metal, or nicely modeled in wax or clay, the chased pattern being the best. A plaster cast is then taken off and cut to the shape required for the die, varnished with thin shellac and sent to the foundry for casting. After the cast is made in bronze, a plaster force is taken out of the plaster for die. The shrinkage is then even on each, and very little fitting is required.

The metal as furnished by E. Miller & Co., of Meriden, Conn., is equal in hardness to soft steel, and will stand equally as much compression. The metal in these dies, although very hard, works in chasing very much like soft steel. The dies are used in both hydraulic and drop presses. Much of the success of working these dies depends on the skill of the pressman. Concerns like the International Silver Co., E. G. Webster, Brooklyn, Cincinnati Coffin Co., and many others are now using them to a large extent and with the best results.

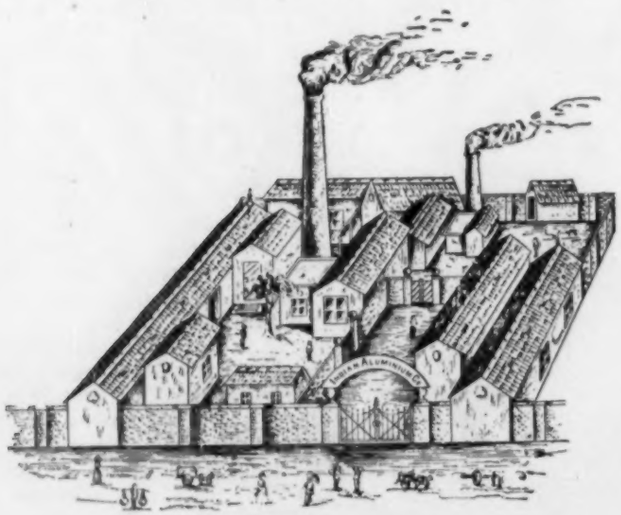
NEW COPPER-WELDING PROCESS.

U. S. Consul Shank, of Winnipeg, Canada, reports that scientific circles are interested in the discovery of a process for welding copper, which has been made by a local blacksmith. It is said the process has been thoroughly tested and found perfect, and that copper can be welded to copper or to other metals without impairing the electrical conductivity and other properties of the metal. The process is said to be very simple and no more costly than the welding of steel. The work can be done with a forge, blowpipe, or any apparatus which will heat the metal cherry red. Patents have been applied for in the United States and Canada.—(U. S. Consular Reports.)

In its general characteristics silver follows copper more or less closely. Its maximum tensile strength is usually somewhat greater, but its properties vary between wide limits depending on its condition whether cast, hard drawn or rolled, or annealed.

AN INDIAN ALUMINUM FACTORY.

An American manufacturer of aluminum goods would scarcely take the illustration shown herewith to be an aluminum factory, so totally different is it in shape, size and appearance from the one usually seen in the United States. Nor is it an American or a European plant, but it belongs to the land of the Hindoo, being the factory of the Indian Aluminum Company, of Madras, India. Though this company has been in business a comparatively short time, they have made remarkable progress, and from all reports aluminum as a metal for household and military purposes seems to have taken as well, if not better in India than in any country of the world. This increasing use of the light metal in the far East is probably due to the instructive work carried on by the Madras School of Arts under the direction of Alfred H. Chatterton, and since developed by the Indian Aluminum Company, who have taken over the work of the School of Arts. Secretary Hawkins of the company has furnished us with a description of the company's factory and some of the work. He says: "The



PLANT OF THE INDIAN ALUMINUM COMPANY.

area of the company's works is about 5,000 square yards, but with this area we are crowded for room and are leasing the adjoining block of ground occupying double the space. The shops we built ourselves with cast iron columns and galvanized iron roofs. Some of the old shops were built with brick walls and tiled roofs, but they are being replaced as opportunity affords. The iron sheds are 20 feet high to give plenty of ventilation and the floors are all tiled to minimize the dust. Our machine shed contains 2 drawing presses with which we can turn out from 3,000 to 4,000 shapes a day, and double action press for small shapes, guillotining, shearing, planing, milling, shaping machines and punching machines, large and small spinning lathes, three or four American Pilter lathes, a large lathe with a 24 point gap bed on which we turn shafting and wheels, other screw cutting lathes and ordinary lathes. Two large machine drills for small work. One bending machine and one rolling machine for sheets eight inches wide. The blacksmith's shop contains besides the forges, a bending machine for tyres and a steam striker. The polishing shop has polishing heads, band polishers and 40 polishing lathes. In the carpenter shop we have a frame saw and circular saw benches, cross cutting and rip. This shop also contains patent mortising and saw setting and sharpening machines. The power we use at present is two 88 H. P. steam engines and an auxiliary oil engine. Altogether we employ 400 hands.

In order to be consistent in our business we use an aluminum lighting conductor for our chimney. Where it is possible we also use aluminum castings for our machinery. On referring to some old orders we find that we have supplied 180 regiments with water bottles and have altogether manufactured over 80,000 during the past six years. We regret that we have given up repousee art metal work, as our time has been too fully occupied with the less interesting but more profitable conservancy carts and cooking pots. Among our small fancy articles, we have perfected an aluminum razor strop and have proved that this strop puts a finer and more lasting edge on a razor than any other strop. All the officers of the company and several of their friends have used these strops for several months, and have found that with ordinary shaving soap as a lubricant the razor requires to be drawn back and forwards on the strop only a few times, and if this is properly done it puts on such a fine edge that shaving can be done without soap and also the edge lasts for two or three shavings. We make these of similar shape to the ordinary leather strop and charge two shillings and upwards, according to the pattern. We also use aluminum hones very successfully in our shops for putting a fine edge on tools.

From the above account it may readily be seen that the Indian Aluminum Works are up-to-date in every particular. Their output has risen from $16,000 per annum in 1900 to $120,000 per annum in 1904.

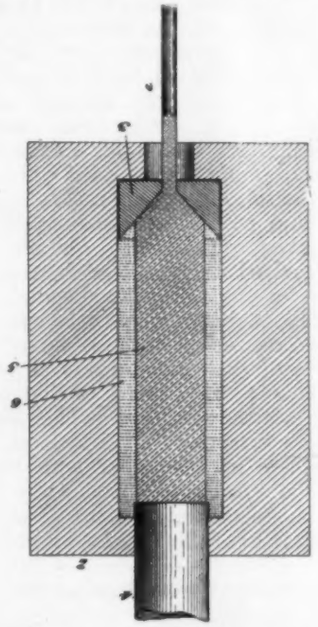
MANUFACTURING METALLIC SHAPES BY EXTRUSION.

The usual method of producing metallic shapes by extrusion consists in either pouring the metal in a molten state into an extrusion cylinder or to introduce into the latter an ingot, which is of such a high temperature that it is so soft as to require little pressure in order to cause the metal to flow through the shaping die. The metal in this soft condition is forced through a die at the end of the hollow plunger and passes out through the hollow center of the plunger. This latter arrangement is intended to prevent the swelling of the ingot which would cause it to lock itself against the sides of the cylinder. The method requires that the plunger should fit the cylinder throughout its entire length and it must fit so closely that no metal from the ingot can force its way between the plunger and the cylinder. At the same time the fit must not be so tight as to cause the plunger to score the sides of the cylinder. The pressure which can be employed in the extrusion of metals by the ordinary method is therefore limited and the limit is not very high owing to the fact that the die expands in proportion to the strain put upon it. The real limit is therefore the amount of pressure which the die will stand without an appreciable change of shape.

A patent which has recently been granted to Mr. W. Hoopes and assigned to the Pittsburgh Reduction Co., has for its object to simplify the process and to make it possible to extrude aluminum or any other ductile metal at atmospheric temperature.

As shown in the accompanying illustration the apparatus in which this new process is carried out consists of

a cylindrical tube 2 provided with a die 3 and plunger 4, the latter being actuated preferably by hydraulic pressure. The ingot 5 of the metal to be extruded does not fill the cylinder completely, as there is a space 6 between it and the cylinder walls, which is filled with oil or any



TUBE, DIE AND PLUNGER.

suitable fluid. When the plunger 4 is moved forward in order to force the ingot through the die, the ingot is prevented from expanding and filling the cylinder by reason of the oil contained in the surrounding space. The pressure of the plunger is thus applied directly to the metal and therefore a greater pressure is transmitted to the latter directly than to the walls of the cylinder. The work is therefore accomplished with less strain upon the apparatus.

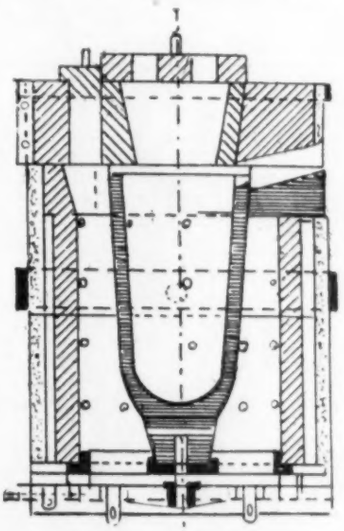
The pressures required to perform the extrusion are dependent upon and almost directly proportional to the ratio of the original area of the ingot to the area of the extruded product and they decrease as the temperature rises. If it is desired to produce a greater reduction of section than a given cylinder will permit at atmospheric temperature, the fluid used in the cylinder may be heated. Thus aluminum is stated to require for its extrusion only about one-fifth of the pressure at 600° F. than at 70° F. Much higher pressures can also be applied by this method, inasmuch as it does not matter particularly whether the cylinder expands or the plunger contracts. The only result would be the escape of some of the fluid, which could be replaced by the introduction of an equal amount by means of a suitable device.

Lead is the heaviest of all base metals, its specific gravity being, when in the solid state, 11.40, and in the liquid state 10.65. The specific gravity of lead will vary slightly according as it is cooled quickly or slowly, hammered or rolled. Commercial lead, on account of the impurities contained in it, has a lower specific gravity than 11.37.

Cadmium forms several amalgams with mercury, which were formerly employed by dentists. The alloys consisting of 50 per cent. cadmium with 50 per cent. mercury and 33 1-3 per cent. cadmium with 66 2-3 per cent. mercury have great malleability and cohesive power.

CRUCIBLE FURNACE.

The furnace shown in the accompanying illustration as edited by Westman in Jernkontorets Annaler is in operation at the works of Basse & Selve, in Altena, Germany. The crucible is situated in a casing of refractory material. It is surrounded and held together by a double casing of sheet iron, and the room between the two sheet iron casings is filled with heat-insulating material. Air channels are arranged between the exterior casing and the refractory casing, from which the air enters into the combustion room by means of a number of round openings which are arranged in a slanting fashion towards the crucible. The crucible is made of graphite and stands upon a block of the same material. In the latter block



GERMAN CRUCIBLE FURNACE.

there is arranged an air channel which divides at the upper part into four channels and through which a part of the air for combustion enters.

The furnace is suspended from a support and can be raised and tilted. The consumption of coke for this furnace is very small. The following figures show the consumption of fuel with the former and the new type of furnaces. There were used with the old form per 100 pounds of metal when melting bronze 63 pounds of coke, while only 19 pounds were consumed in the new furnace. Similarly for nickel the old furnace used 85 pounds per 100 pounds of metal, while the new one only consumes 30 to 35 pounds. For brass the new furnace uses 11 pounds, while the ol done consumed 37 pounds per 100 pounds. The new furnace is built for crucibles containing 220, 440 and 660 pounds.

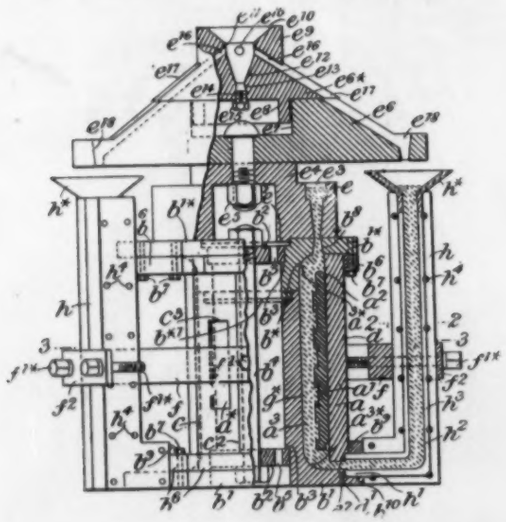
A tungsten-nickel alloy manufactured by George G. Blackwell, Sons & Co., of Liverpool, England, contains 73 to 75 per cent. tungsten, 23 to 25 per cent. nickel, 2 to 2.5 per cent. iron, 0.75 to 1 per cent. carbon and 0.25 to 0.50 per cent. silicon.

The correct temperature for casting is one of the matters which have to be taken into consideration and for which a considerable practical experience is required in order to be able to judge the right temperature. The influence which the casting temperature has upon the properties of the resulting alloys is very clearly set forth in an article in THE METAL INDUSTRY, Vol. II., page 195.

NEW MOLD FOR CASTING BEARING BRASSES.

In the usual method of producing brasses or bushings for bearings the latter are first cast to approximately the size and shape required and the faces are then bored or turned to fit the diameter of the shaft for which they are intended. A mold has recently been constructed by W. G. Hanna of Glasgow, Scotland, and patented with U. S. Patent No. 795,830, August 1, 1905, which is intended to produce brasses which are to fit directly the size, diameter and form of the axles to which they are to be applied, so that no further work is necessary.

In the adjoining illustration, which represents the sectional elevation of a complete apparatus, the castings are shown in position, *a* representing the body of a brass bushing, the face of which is provided with spiral grooves, a^1 of a flattened V section. The cylindrical core *b* which should have a highly polished surface is formed of a diameter equal to that of the shaft with which the fin-



MOLD FOR BEARING.

ished brass is to be used. The proper distribution of the metal is insured by means of a so-called pouring block, which is provided with a funnel mouth e^{10} into which the fluid antifriction metal is poured from a ladle. It flows down the inclined channels e^{16}, which open into corresponding but open channels e^{17}, communicating with vertical tapered holes e^{18} situated just above the funnels *h* on the pouring tubes. The castings are therefore cast from the bottom, so that the metal is free from blowholes.

The whole apparatus is constructed so that it can be easily taken apart and put together. Thus any metal which has solidified in the pouring channels can be readily removed. The details of the construction are described at length in the patent mentioned above. It is claimed that cutting into the surface of the cast antifriction or other metal when it is produced in the ordinary manner destroys the skin of the metal, opens its pores and increases its frictional resistance to the revolving axle or shaft.

THE MANUFACTURE OF SILOXICON BRICKS.

The new refractory material Siloxicon, made by Mr. Acheson and produced in the electric furnace at Niagara Falls has been briefly described in the June, 1905, issue of THE METAL INDUSTRY, p. 115. The following description of a recently patented process of treating Siloxicon in order to produce refractory articles such fire bricks will therefore be of interest to our readers. The process consists essentially in the introduction of compounds which are enabled to act as reducing agents or fluxes upon the constituents of the Siloxicon at or near the surfaces of each of the granules of the latter. The process has been patented by B. Seaboldt of Salt Lake City, Utah, with U. S. Patent No. 796,459 of August 8, 1905.

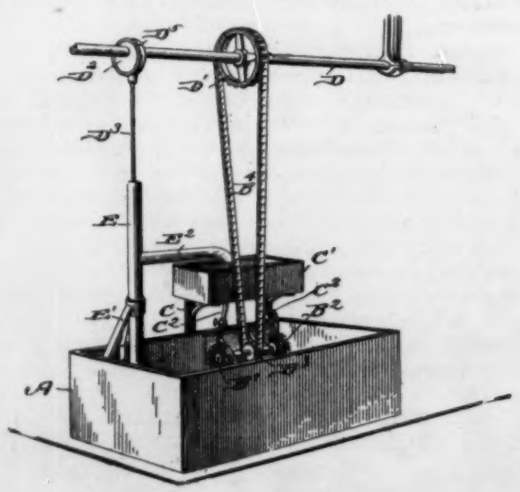
The inventor has added to 90 per cent. of Siloxicon in the granulated state, preferably passed through a 40 mesh screen, 7 per cent. of No. 1 fireclay (preferably containing not less than 30 per cent. alumina and 50 per cent. Silica) and about 1 per cent. of bran, wheat or oat chaff. These ingredients are thoroughly mixed dry, and about 2 per cent. of common salt is added with sufficient water to enable the mass to be readily molded. The mixture is then stirred and molded into shape, and the resulting bricks are stacked into the kiln. The temperature of the latter is then raised sufficiently high so as to insure the decomposition of the fluxing compounds added to the Siloxicon. The temperature must be sufficiently high to insure the decomposition of these fluxes and the reaction of certain of their constituents as reducing agents upon the surface of the granules of Siloxicon.

It is stated that the resulting molded and fluxed product will consist essentially of Siloxicon, the grains of which will adhere to each other with such tenacity as to be substantially inseparable under any temperature to which they may be subjected, short of that required for the actual formation of the Siloxicon itself.

NEW FORM OF POLISHING APPARATUS.

A patent recently issued to J. H. Gray, New Philadelphia, Ohio, aims at providing a contrivance by which the pumice stone or other cleaning material can be used over again, thus preventing waste of it.

The apparatus, as shown in the accompanying illustration, consists essentially of a water-tight box resting on a table, which box has an inclined bottom sloping towards one end. It carries two polishing wheels, B^2, actuated from a shaft D overhead by means of a sproket wheel and chain. An eccentric D^5 sitting on the shaft D ac-



POLISHING APPARATUS.

tuates a pump E, which pumps the water and the pumice stone, which have accumulated after use in the bottom of the tank, back into the reservoir C^1 located above the buffing wheels, so as to supply the polishing material again to them. The material is thus used over and over again. This method of procedure is also adapted for use where the supply of water is scant, inasmuch as no running water is required.

NEW SAND BLAST APPARATUS AND HIGH PRESSURE BLOWER.

The accompanying cut shows a new sand blast machine Manufactured by Leiman Brothers, of 139-143 Centre street, New York City, which is made of heavy galvanized sheet iron. Windows in the top enable the operator to watch the effect of the sand upon the articles under treatment. The front of the machine is provided with arm holes to which cloth sleeves are attached to protect the forearms of the operator down to the wrists and to prevent the sand from being blown out. Enough sand is placed in the machine to fill the small funnel-shaped sand holder at the bottom, from which the sand is drawn through the sand feed tube to the operating nozzle. By a novel arrangement of tubes attached to the air pressure tube, a suction is created in the sand feed tube which draws the sand up to the operating nozzle or mixer, where it is met by the air blast and forced on the article

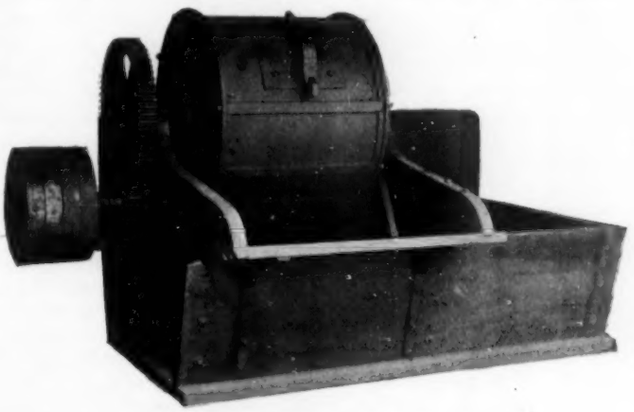
BLOWER AND SAND BLAST.

under treatment. The sand then passed down to the sand holder and is used over again continuously. An important feature of the machine is that the tubes are all short, so that there is no waste of air pressure, while the tubes cannot clog up or wear out quickly, as often occurs with long tubes. The machine takes up very little space, inasmuch as the size of the body is only 18 x 24 inches. Larger sizes can be made to order.

The high pressure blower, shown in the second illustration, is used in connection with the sand blast machine. It is also of an improved construction and manufactured by the same firm. Its working parts are so arranged that they take up their own wear and tear and a perfect fit is always assured and the machine will work equally as well whether new or old, running noiseless all the time without continual expense for repairs. The machine, besides sand blasting, can be used for melting furnaces, blow pipes, agitating solutions, etc.

A NEW WATER-TUMBLING BARREL.

The Cleveland water-tumbling barrel, made by the J. D. Smith Foundry Supply Company ,of Cleveland, Ohio, and shown in the accompanying illustration, has a clear cypress tank with slip tongues leaded in. It is provided also with heavy lag screw fastenings and iron braces under the apron as well as bracketed end bearings. One of the most important features are the eight flat tie rods with recessed flanges on the barrel head, which allow the



WATER-TUMBLING BARREL.

easy removal of the head. This can be accomplished by taking off the eight nuts, and thus an easy access can be had to the interior of the barrel for the purpose of renewing the lining. The barrel is built right or left handed. Water is fed in the right hand hollow bearing and passes through the barrel and out again through holes in the left head of the barrel. The staves are made of hard maple. The points given above will be appreciated by every brass foundryman.

A NEW CINDER CRUSHER.

A new machine for washing brass furnace ashes called the "Monarch Crusher and Pulverizer," has just been put on the market by O. J. Moussette, Driggs avenue, corner of North 10th street, Brooklyn, N. Y. This machine is claimed to be an improvement on other styles, and among the features are a toothed ball for crushing and roller bearings. The toothed ball of the machine is in the form of a double cone with the two parts loosely fastened together, and the cinder material is crushed as it passes between the teeth of the two halves and also by the toothed part of the outside of the ball. The machine is suitable for brass foundries, rolling mills and smelting works and a cut and further particulars of the crusher may be seen on another page.

A coating for wooden vats is stated to be made by heating 80 pounds of tar till all the water is evaporated, and then adding 80 pounds of cement or hydraulic lime, with constant stirring. The mixture should remain thin and fluid. When applied it is heated and put on hot. It is said to resist acid and to be flexible.

The West Side Branch of the Young Men's Christian Association, New York City, has started a course of lectures in printing and publishing which is designed for employing printers, superintendents, foremen, compositors, pressmen, apprentices and all others interested in printing and publishing.

CORRESPONDENCE DEPARTMENT

In this Department we will answer any question relating to the non-ferrous metals and alloys. Address THE METAL INDUSTRY, 61 Beekman St., New York.

Q.—The question was brought up to me the other day how I could produce a smooth hard finish on spelter work with bronze powder. I first varnished the work with several kinds of varnishes as tests and then when they were almost dry I rubbed on some bronzing powder with a soft rag. I then proceeded to lacquer the product thus obtained with French varnish. With one of the varnishes which I used at first I obtained a very hard lustrous finish while the others were dull. The varnish was very sticky and quick-drying, but as I happened to have this varnish on hand I tried it merely for the experiment without knowing its name. Will you please let me know what varnish I can use in place of it and still produce the hard lustrous finish?

A.—Hard oil finish diluted with a good quality of turpentine or equal parts of oil of lavender and turpentine will give the results desired. The bronze powder may be mixed with this varnish. After drying lacquer with French varnish. It is well to apply the French varnish to the metal before and after bronzing. This method makes it more adhesive and it dries more rapidly. For finer effects the hard oil finish is sometimes applied to the varnished metal surface first and the dry powder applied with a rag or camels hair brush. When using a brush, moisten slightly with a very little oil of lavender, which latter makes the powder cling better to the brush. French bronze powders should be used to give the richest effect.

Q.—Kindly let me know anything that will prevent malleable iron (brass plated and buffed) from oozing out after it has been lacquered and dried?

A.—One of the best remedies for preventing the spotting of brass-plated iron goods is to boil them out thoroughly in boiling water to which is added about 1 oz. of common unslacked lime to each gallon of water used. The articles are then left to dry for several days and passed through a slow acting bright acid dip, after which they are washed and dried. If it is impossible to let the goods stand for that length of time, proceed as before but after removing them from the lime solution, wash and immerse them in a one per cent. solution of muriatic acid. The goods are then washed and dried thoroughly on a heater or in an enclosed oven. Both of these methods will give a beneficial result.

Q.—I should like to have the formula for making an easy running soft solder, namely one that will flow at a low temperature, something like what is used on fire extinguishers.

A.—A solder that will flow at 202 degrees consists of 3 parts of tin, 5 parts of lead and 3 parts of bismuth. Pewterer's soft solders consist of:

3 parts of tin,
4 parts of lead,
2 parts bismuth.

A series of tests which has just been carried out by one of our correspondents shows the mixture 60 tin and 40 lead to have the lowest melting point, that is 334 degrees F. All the special solders of unusually low melting points are expensive because they contain bismuth, etc.

Q.—I should like to get a good rose gold solution for plating jewelry where the scroll work stays a deep red color and the relieved parts brush up nice and yellow. I think this must be done with pure gold and I should like to be able to get some idea as how to make the above solution.

A.—Pure gold will not produce a rose gold finish. It must contain copper as an alloy. In producing cheap work the acid copper bath is made use of to a great extent, as it produces the exact effect when the high parts are relieved with silver sand and immersed in any good gilding bath. A few seconds of immersion in the acid copper will produce the dead surface. A solution for the direct production of rose gold is made up as follows:

Chloride of gold, 8 dwts.
Carbonate of copper, 10 dwts.
C. P. cyanide, 6 oz.
Water, 1 gallon.

The copper salt is dissolved separately in a little of the cyanide and water and is added slowly to the gold bath. The latter should be at a temperature of 130 or 140 degrees. A 10 kt. anode of gold and copper is used and a somewhat strong current is applied at first in order to give the desired finish to the background. The relieved parts are then brushed and the articles are immersed in the bath using a lower current to give the yellow appearance to the relieved parts. This latter operation should be only a flash.

Q.—We enclose you a check of which we would like to know the finish and its manner of production.

A.—The sample check is finished with the usual bright acid dip finish and lacquered. In order to produce this finish the articles are first strung on soft copper or brass wire, with common china buttons between them to keep them from sticking together. They are then immersed in a solution of hot caustic potash of a strength 6 to 8 oz. to each gallon of water, in order to remove the grease or oil. They are then washed in cold water and immersed in an acid bath for a few seconds. The acid bath is made up as follows: To one gallon of pale Aqua Fortis add 1 gallon of Oil of Vitriol, ½ gallon of cold water and 8 oz. rock salt. The ingredients are thoroughly mixed and left to stand for several hours. After passing through the acid bath, the articles are washed in cold water and dried with the aid of boiling water and maple sawdust. After drying the checks should be lacquered while on the wires. A dip lacquer for this purpose may be purchased from the manufacturers of such lacquers or from dealers in platers' supplies.

Q.—Kindly give us information as to what treatment is generally given to nickeled work that is to be left with a dull finish. We refer to typewriter parts, etc., both sheet metal and castings, which are not buffed before or after plating. We get a good white deposit but in assembling the machine the work gets badly stained from finger marks, etc. We have not been able to find a suitable lacquer which can be applied without changing the appearance of the white metal.

A.—Dull or dead finished nickel is very sensible to finger marks or stains. You might try the soap solution method as mentioned by Chas. H. Proctor on page 187 of the November issue, 1904, of THE METAL INDUSTRY. This solution will probably assist to some extent and make the finger marks easier to remove. You might also try a very hot solution of sodium silicate (water glass) made up as follows: To 1 part of commercial sodium silicate add 2 or 3 parts of hot water, maintaining the solution near the boiling point. The nickel work is washed in the usual manner and is plunged momentarily into this solution. The drying is accomplished with the aid of heat. This method of procedure will give an invisible coating, which should not add lustre to the goods and prevent them from marks and stains.

CORRESPONDENCE DEPARTMENT

In this Department we will answer any question relating to the non-ferrous metals and alloys. Address THE METAL INDUSTRY, 61 Beekman St., New York.

Q.—I should like to have the formula for a zinc solution for plating from a zinc anode to a zinc cathode.

A.—A solution for zinc plating which has been found to work very satisfactorily is made up as follows: 24 oz. of dry chloride of zinc and 16 oz. of ammonium chloride are dissolved in 3 gallons of warm water. To this solution add 2 oz. of commercial hydrochloric acid to which is added 4 oz. commercial glycerine. This solution gives a good dense deposit. The distance between the anode and the cathode should be 4 to 6 inches. A slight movement of the solution gives better results. The solution should be used cold with anodes of commercially pure zinc cast in iron molds. A voltage of from 4 to 6 volts should be used.

Q.—Will you kindly send us a receipt of a solution for cleansing and brightening bronze castings?

A.—An acid dip for bronze casting should be made up as follows: One gallon pale Aqua Fortis, 38° Baumé, 1 gallon Oil Vitriol, 66° Bé.; 4 quarts of water; 8 oz. rock salt. In mixing the acids add the vitriol to the aqua fortis, after which the water should be introduced and then the salt. After mixing, the acids should stand 10 or 12 hours before using. If much dipping is to be done a number of gallons should be made up and the receptacle placed in a tank surrounded by running cold water in order to maintain the acids at as low a temperature as possible. It is advisable to use a soap solution in connection with the acid dips, such as is mentioned on page 187 of the November number, 1904, of THE METAL INDUSTRY.

Q.—We are sending you a curtain pole ball of which we should like to know the finish.

A.—The sample of a curtain pole ball is probably coated with a diluted solution of sodium silicate, commonly called water glass, in the following manner: Take 1 part of commercial sodium silicate solution and add 2 or 3 parts of boiling water. After the articles have been silvered by any of the usual methods and washed in cold water, pass them momentarily through the water glass solution and dry thoroughly on a heater in the same manner as for lacquering. This procedure will give the articles an almost invisible coating which will protect them from oxidation. This solution should be used very hot. It does not cost more than a few cents per gallon when made up and answers the purpose very satisfactorily.

Q.—In making ingot spelter we are having some trouble on account of a frosty appearance in the center of the top of the slab; the fracture shows also a frosty appearance in the center. Kindly give us some information with a view of overcoming this.

A.—Scrap zinc as such carries some impurities, such as iron, lead, zinc oxide, etc. During the melting operation the metal is further oxidized. The solvent power of metals increases with the temperature and this action is specially marked in respect of their own oxides. The temperature being lowered the dissolved impurities are forced out of solution and appear as a scum on the surface of the bath. When the metal is cast in slabs, the last portion to solidify and therefore the last portion to preserve a high temperature is the center of the slab; there also are concentrated the impurities as fast as they are ejected from the solidifying portions of the slab. This describes the well known phenomenon of segregation. The metal should be melted at as low a temperature as possible, casting to begin when the bath has been brought to a temperature but a few degrees higher than the freezing point. The frosty appearance on the top and center of the slabs originates from the same cause. However, slabs of remelted scraps seldom have the silvery appearance of the virgin metal.

READERS' OPINIONS.

Correspondence is solicited from all of our readers on subjects relating to the founding, finishing, rolling and plating of the non-ferrous metals and alloys. Name and address must be given, though not necessarily for publication. Address THE METAL INDUSTRY, 61 Beekman street, New York.

AGAIN THE IMPORTANCE OF THE CASTING TEMPERATURE.

To the Editor of THE METAL INDUSTRY:

An incident occurred not long ago that you can perhaps use to illustrate the facts that careful attention to the melting of brass and to the making of the molds are important points in producing sound castings. A short time ago I was requested by a foundryman to express an opinion as to why certain brass castings were porous after being turned. The castings weighed about two pounds each. Before finishing, the surface was all that could be desired, in fact, to me, suspiciously smooth. The stock used was a fair grade of ingot copper, 64%; spelter, 34%; lead, 2%.

As this is a good mixture to machine, and should turn up sound, I decided the trouble must be somewhere else. I visited the foundry and observed the molder at work on the job, casually felt his sand to ascertain its temper, and concluded that he was not apparently at fault.

When his molds were poured, however, I expressed my opinion at once, namely, that the metal was not poured hot enough. Succeeding heats were poured with the metal at a higher temperature and with other conditions the same. The result was no more trouble with porous castings. It has been my experience that brass, whether made of lake copper and M. & H. spelter, or scrap containing wire nails, emery grindings or any old thing, will make spongy, porous castings unless melted carefully and poured at the right heat into sand that is properly tempered and rammed.

A. B.

AMERICAN SILVER COINS IN CANADA.

(From United States Consul Dudley, Vancouver, British Columbia.)

During the last few months there has been much agitation in this and other Canadian provinces looking to the discontinuance of the use of American coins in Canada. The Toronto Globe recently referred to this subject in the following words:

"The crusade of the Manufacturers' Association against American silver in Canada is not likely to be any more effective than some previous crusades. The only way to succeed is to induce Canadians to refuse the foreign coins, and this they will not do."

Canada coins 5, 10, 25 and 50-cent pieces, but has no $1 pieces and no gold coinage.

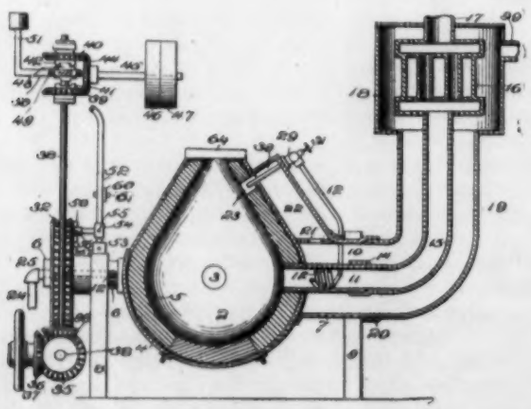
PATENTS

A full copy of any Patent mentioned will be furnished for Ten Cents. Address THE METAL INDUSTRY, 61 Beekman Street, New York.

797,287. August 15, 1905. MACHINE FOR BENDING METAL SCROLLS FOR POLISHING WHEELS. V. W. Jewett, Montpelier, Vt.—The machine consists of a horizontal driving shaft which meshes with a bevel pinion actuating a vertical shaft, which latter has a scroll forming wheel. The scroll forming wheel is provided with a raised scroll-shaped central block and outer removable scroll shaped ribs. It also has a intervening scroll-shaped groove and holes in its outer part for the reception of removable pins. The ribs are adapted to be lifted out at will and the pins are adapted to be inserted in the holes for assisting to hold the metallic ribbon to be operated upon.

797,221. August 15, 1905. HELICAL ROLLS FOR ROLLING METAL. F. L. & W. L. Price, Philadelphia, Pa.—The invention relates to rolls for rolling from blooms, billets or other shapes bars of any cross section and also for rolling tapering bars or bars whose cross section varied from end to end. The rolls have a helical pass of changing section formed between them, which pass consists of one or more convolutions separated by a helical flange or ridge on one roll and a complemental groove on the other roll. One face of the flange is made substantially straight and forms part of the pass and the other side of the flange is beveled and co-operates with the complemental surface in the groove. The large end of the pass is initiated by a stop and the small end is terminated by a cut-off device.

794,762. July 18, 1905. MELTING FURNACE. W. E. Williams, Chicago, Ill.—The furnace is intended for melting brass or other metals and as shown in the adjoining figure is arranged for being tilted. It has a furnace body with cover and spout, the furnace



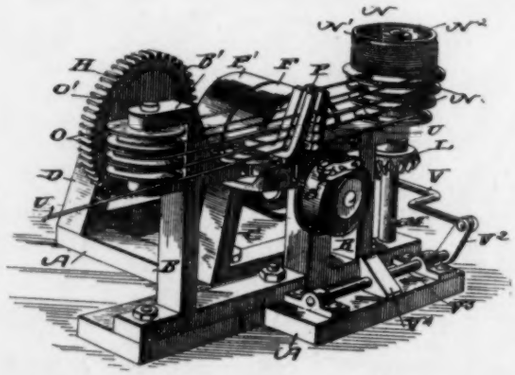
body consisting of a metal shell 4 with a refractory lining 5. The incoming blast conduct passes along the axis of rotation of the furnace and is heated on its way to the furnace by the waste gases passing out of the furnace. The fuel to be used is preferably fluid and is directed into the furnace by a nozzle 30 controlled by a valve 31.

795,886. August 1, 1905. MAKING ALUMINUM. A. G. Betts, Troy, N. Y.—The patent describes the production of aluminum directly from bauxite. The crude ore is reduced directly to the metallic state and the product is aluminum combined or mixed with other elements such as carbon, iron, silicon, titanium, copper, zinc, tin, lead, etc. This product is placed in a fused state at the bottom of an electrolyzing cell, which contains an electrolyte specifically lighter than the aluminum-containing product, but heavier than fused pure aluminum. The latter therefore floats on top of the electrolyte. The electrolyte may be cryolite saturated with alumina, cryolite and barium chloride. The layer of fused pure aluminum is electrically connected as cathode, while the aluminum-containing product is connected as anode. By passing the electric current, pure aluminum is deposited at or in the cathode, being dissolved from the anode.

795,023. July 18, 1905. MEANS FOR ROLLING UP LEAF METAL. O. Blankmeister, Dresden, Germany.—The invention intends to prevent the web of paper which is wound simultaneously with the band of leaf metal upon a coil from sticking to the metal. The inventor overcomes this by applying between the paper backing and the edge of the metal, ribbon or strips of paper fabric or like suitable material. By this method the stamping of leaf metal can be carried on with much greater speed, as the leaf metal can be easily detached from the paper backing.

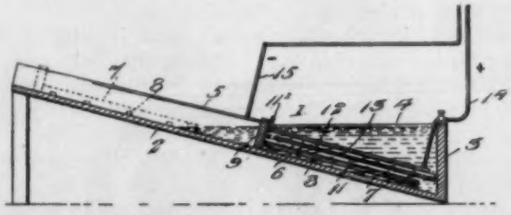
795,887. August 1, 1905. ELECTROLYTICALLY REFINING SILVER. A. G. Betts, Troy, N. Y.—Silver alloys are refined in an electrolyte made up of strong non-oxidizing acids to which small amounts of substances such as gelatine and gum-arabic have been added. A specially suitable solution contains 4 per cent. silver as silver methyl sulphate and 4 per cent. of methyl sulphuric acid.

796,261. August 1, 1905. WIRE DRAWING MACHINE. A. Smith, Trenton, N. J.—The machine, as shown in the illustration, is composed of a frame, horizontal driving shaft, vertical shaft and gearing between the driving shaft and the vertical shaft. A drawing and winding device is mounted axially on the vertical shaft and consists of a drawing drum N^1 with collars located



between the steps. A winding drum N^2 is located above this drawing drum. A single series of guide rollers are provided on the same vertical axis and a die holder is mounted on the frame intermediate between the drawing and winding device and the series of guide rollers. The die holder is slotted at right angles and a series of dies are inserted in it. A winding drum is provided on which a sufficient quantity of wire is wound to start the machine. The wire can thus be drawn to the desired thinness or fineness and the starting operation can be accomplished quickly and easily.

796,872. August 8, 1905. ELECTROPLATING DEVICE. H. Schuessler, Peru, Ill.—The invention consists of a tank with a horizontal inclined bottom provided at its forward lower end with a comparatively high end wall. Arranged for a longitudinal sliding movement within the tank 1 is a carrier 6 in the form of an open frame composed of longitudinal members or bars. The contact member 9 has at its ends contact portions or fingers 10,



adapted in practice to override the contact strips 5, the carrier 6 being intended to receive the plate 11. An anode 13 is located immediately above the carrier and the plate 11. The carrier is moved to the dotted position shown in the figure for receiving a plate and is then returned to the full-line position in the figure. The plate is therefore prevented from buckling and the amount of solution required is reduced to a minimum.

PATENTS

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796,338. August 1, 1905. PULVERIZING METALS. H Maxim, New York.—The process has for its object mainly the reduction of aluminum to an impalpable powder. The metal is first melted in any suitable furnace, crucible or retort and the molten metal is then poured or admitted in a stream to a blast or current of a suitable gas or vapor under high pressure, by which it is atomized. It is then forced by the gas current preferably through an additional atomizing device, whereby the fluid aluminum is atomized and blown into a fine mist or spray. This is allowed to escape into a chamber in which the metal settles in the form of a fine dust or impalpable powder, the fine particles solidifying from loss of heat before reaching the bottom of the receiving chamber. As the melting of aluminum is only 625° centigrade, the apparatus may be made of steel or nickel steel.

TRADE NEWS

Trade News of Interest Desired from All our Readers. Address THE METAL INDUSTRY, 61 Beekman St., New York.

Besides being used for a wide variety of purposes in lubrication the Dixon Ticonderoga Flake Graphite is used beneficially on wire ropes.

Edstrand & Olsen, nickel platers, of Chicago, Ill., are increasing the size of their already large jobbing plant. Their capacity will be doubled.

The Dings Electro-Magnetic Separator Company, of Milwaukee, have just shipped three magnetic separators to customers in British Columbia.

Since the teamsters strike has been settled in Chicago, Ill., jobbing work is picking up in the plating line and business in general is prosperous.

The plating plant of the Detroit Stove Works, of Detroit, Mich., are improving and increasing the capacity of their plant by several thousand gallons.

Josef Radnai, who pays cash for old precious metals and minerals, mercury, bismuth, platina, etc., has opened a new office at 284 Pearl street, New York City.

The Illinois Plating Company, located in Canal street, Chicago, Ill., were burned out recently, but have installed a new shop in the immediate vicinity. Their plant is now better than ever.

The Bowlus Automatic Scales Company has been incorporated at Springfield, Ohio, with a capital stock of $50,000. The company are placing an automatic weighing machine upon the market.

The S. Obermayer Company, at their Chicago plant, have added a large woodworking department, with special and improved machinery to facilitate prompt shipments of flasks of all kinds.

The Fort Wayne Smelting and Refining Works, of Fort Wayne, Ind., have bought the brass foundry of Faver Brothers, of Detroit, Mich., and will continue to make castings in brass, bronze, aluminum, etc.

Andrew J. Morse & Son, 221 High street, Boston, Mass., are issuing a card which describes their Morse Monitor Nozzle, which is used as a suitable means of fire protection for all classes of buildings.

Joseph Smith, of Detroit, Mich., is moving his shop into more convenient quarters and expects to install a plant which will be second to none. Barney Nehls, also of Detroit, has his shop finely equipped.

The brick storehouse of the American Pin Company, of Waterville, Conn., is nearing completion. The new building forms the north wing of the company's plant and will be carried up to the same height as the others.

The New England Enameling Company, of New York, have leased the entire plant of the National Enameling and Stamping Company, located in Portland, Conn. The company manufacture enameled, tin and galvanized ware.

A four-story addition is being made to the brass foundry of Edro Richardson, 318 North Holliday street, Baltimore, Md., which will provide for a brass finishing and pattern storage departments. It is to be completed by November 1, 1905.

The Continental Silver Company, of Scottsdale, Pa., have succeeded The Grilley Company, of New Haven, Conn. They will manufacture a full line of hardware for undertakers use. They will appreciate catalogues from the trade which supply their lines.

In order to cover the advance of raw maternal, the brass and copper manufacturers have increased the price of sheet copper 2 cents per pound and lowered the discount on sheet brass accordingly. The latest price lists will be found on our page of metal prices.

Kline & Co., brass founders, of Reading, Pa., are putting up a new brick brass foundry 50 x 75 feet. They report an excellent business. The Crescent Brass Manufacturing Company, also of Reading, have built an addition to their brass foundry. They are very busy.

Six molders employed in the brass foundry of the Holyoke Valve and Hydrant Company, of Holyoke, Mass., were ordered to strike. An increase of wages and recognition of the union are the issues. It is hoped that there will be an early settlement of the differences.

The Boroughs of Manhattan and the Bronx, New York City, recently advertised for bids for furnishing all of the labor and materials required for the completion and erection of a brass foundry, indicating that a brass foundry is becoming part of a municipal equipment.

The business which has been carried on for a number of years under the title of John Williams, 556 West Twenty-seventh street, New York, has been incorporated with a capital of $300,000. The directors are: John Williams, J. H. Valentine, O. H. Burgess, all of New York.

The Luce Electro-Plating Works have been incorporated at Binghamton, N. Y., with a capital of $5,000. The incorporators are: Norman Luce, Clark S. Tallman and Linley E. Sturdevant, all of Binghamton, N. Y. William E. Ross, P. Paul Hahnemann and Myrtle M. Luce, all of Union, N. Y.

Dowst Bros. Manufacturing Company, of Chicago, Ill., have bought out the Union Metal Company. Both firms are manufacturers of small metal novelty goods in soft metal. Both firms use the plating barrel exclusively in their work, the two firms operating about forty-six of these barrels.

TRADE NEWS

Trade News of Interest Desired from All our Readers. Address THE METAL INDUSTRY, 61 Beekman St., New York.

The Pearl Smelting and Refining Works, of Philadelphia, Pa., announce that they have moved to East Cumberland and Gaul streets of that city, where they have acquired a large property with excellent transportation facilities. They expect to be in a better position to handle their increasing business.

Messrs. Lewis A. Thompson and Leslie C. Peirson have been recently appointed receivers for the Standard Lamp and Glass Company, of Trenton, N. J., and have taken charge of the business. The court has ordered that the business be continued, and the receivers report that there is a good prospect of it being reorganized.

Keystone Lock Works, Lancaster, Pa., E. T. Fraim, Proprietor, have just completed an addition to their brass foundry, and now have an up-to-date foundry for making very sensitive castings, such as seals, umbrella handle molds, and core work of every description. They claim to make the finest castings in this section of the country.

The Springfield Metal Body Company have broken ground for the erection of a modern up-to-date three-story brick factory to cost $30,000, located at Brightwood, a suburb of Springfield, Mass. The company employs 200 men engaged in the manufacture of metal automobile bodies and tops, which they make of aluminum and other metals.

In a neat leaflet the Newburyport Silver Company, Newburyport, Mass., announce that owing to the rapid increase of their business they have moved to Keene, N. H., where they are now located in a fine modern factory building equipped with electric power and every improved facility for the economical manufacture of a high type of silverware.

The W. L. Cornelius Company, of Westville, Laporte County, Ind., have been organized to manufacture a patent ballot box for secret societies. It is distinctively new and the company expect a large demand for it. The box will be made of metal if the company can do so without making it too heavy. They may also manufacture other metal novelties.

The Manitowoc Aluminum Novelty Company, of Manitowoc, Wis., report a fine business, and that they are continually adding new novelties to their line. The comb business they say is not as brisk as it might be. They also report that no meeting of the Aluminum Manufacturers has been held for two years, and that the competition for business is as fierce as ever.

The United Zinc and Chemical Company, 813 West Thirty-ninth street, Chicago, Ill., are offering to the plating and metal trades what they term as the strongest and purest lye sold. The lye is put up in different quantities of from 1 to 100 pounds. They have received a number of inquiries and secured a good customer since advertising in THE METAL INDUSTRY.

On account of the universal demand for the Steele-Harvey Metal Melting Furnaces and the largely increased sales, the makers, the Monarch Engineering and Manufacturing Company, Baltimore, Md., will be compelled to double their present shop capacity and by October 1st will be in the market for shop equipment. Both their domestic and foreign trade is rapidly increasing.

The Indian Aluminum Company, Madras, India, write us that they are supplying a large number of firms with aluminum for motor cars and for carriage bodies. They have also found a new outlet for aluminum scrap, the iron foundries using it for making patterns and also mixing with the iron castings. The company issue a leaflet stating the uses of aluminum and describing the metal.

The Atco Manufacturing Company, Atco, N. J., recently incorporated with a capital of $20,000, has taken over the plant of the Arthur Light Company. They manufacture to order in quantities metal goods of brass, copper, aluminum iron and steel. Estimates will be promptly and cheerfully furnished from samples and drawings. The officers are: J. F. Irby, president, and Arthur Mende, secretary and treasurer.

John C. Culbert, Pawtucket, R. I., who buys large quantities of brass washings, brass skimmings, brass sweepings, copper scale, brass grindings, brass pin dust, copper grindings, magnet machine tailings, desires to inform the brass and copper rolling mills throughout the United States that he is glad to make them an offer for their material and requests that they send him a sample at his expense. Mr. Culbert's motto is fair and square treatment.

The Frankfort Brass Works, Frankfort, Ind., have reincorporated under the title of The Franklin Brass Works Company with a capital stock of $30,000. They manufacture the same class of goods as formerly for plumbing, gas and steam supplies, their specialty being steam and quick opening hot water radiator valves. The officers are: W. H. Coulter, president; J. P. Given, vice-president, and J. B. Marvin, secretary, treasurer and general manager.

The Bronze Powder Works Company, of 50 West Broadway, New York City, is to build a plant 110 x 175 feet at Elizabeth, N. J., fully equipped with the latest improvements in bronze powder making machinery. The works were formerly Carl Schlenk and they are the American branch of Bronzefarbenwerke Aktiengesellschaft, vorm Carl Schlenk, at Roth, near Nurnberg, Germany, which concern is the largest manufacturer of bronze powder in the world and is capitalized at $312,500.

By the last of the year The Henry-Bonnard Bronze Company, who have been located at 436 West Sixteenth street, New York, for a good many years, expect to have in operation their new plant at Mount Vernon, N. Y. Two main factory buildings 76 x 230 feet will be erected. The plant will be operated by electric power and an industrial railway will connect the various structures. The total cost of construction, including equipment, will be approximately $200,000. The H. Wales Lines Company, of Meriden, Conn., have been awarded the contract for a number of the improvements.

An amended certificate increasing the authorized capital stock of the National Lead Company has been filed in the office of the Secretary of State at Trenton, N. J. The certificate shows that there have been issued 149,054 shares of common and 149,040 shares of preferred 7 per cent. cumulative stock, of which 109,126 common and 106,649 shares of preferred stock voted affirmatively to the stock increase, which is now divided into $25,000,000 common and $25,000,000 preferred stock. It is expected that the formal announcement will be made shortly of the consolidation of the National Lead and United Lead Company.

In a leaflet issued by the Taunton-New Bedford Copper Company, of New Bedford, Mass., the company give the following list of their products: Copper and its alloys, necessary to ship and engine building and other kinds of marine work. Yellow (Muntz) Metal Sheathing and Naval Brass. In dimension sheets, bolts and bars, sheathing, slating and boat nails, condenser and supporting plates, piston and pump rods. Parsons' Manganese Bronze, in all the above forms. Also Taunton Yellow Metal Sheathing and Pure Copper in sheets, bolts, bars, rods, nails, tacks, etc. The company guarantee superior quality and prompt shipments.

TRADE NEWS

Trade News of Interest Desired from All our Readers. Address THE METAL INDUSTRY, 61 Beekman St., New York.

The Syracuse Smelting Works are now located in their new plant at the corner of Thirty-sixth street and Tenth avenue, and are ready to execute promptly orders for all metals that they manufacture and handle, especially phosphor tin. They also sell phosphor bronze, red and yellow ingot brass, manganese bronze, aluminum, bismuth, nickel, pig tin, spelter and other metals required by brass foundrymen. They are sole agents for the M C C ingot copper. Besides these metals the Syracuse Works supply crucibles, scrap brass, and are themselves buyers of copper concentrates, brass skimmings, brass ashes, brass grindings, brass buffings and all by-products that contain metal.

NEW CATALOGUES

A new issue of Power Transmission Appliances, embracing many new ideas, mechanical devices and suggestions, is nearing completion, and will be issued by Patterson, Gottfried & Hunter, Ltd., of 146 Centre street, New York City. This catalogue will give valuable information on the subjects treated. Another catalogue issued by the company is No. 39, which contains 250 pages of the highest grade of catalogue literature devoted to tools and machinery for the smith of all trades.

The Millers Falls Company, of Millers Falls, Mass., and 28 Warren street, New York City, have issued a new catalogue illustrating and describing their line of specialties, which includes the following: Bit braces, brace and chain drills, extension bit holders, hand and breast drills, bench drills, hack and coping saw braces, grind stones, mitre boxes, etc. The company announce that they have made many improvements in their well known line of specialties, bringing them to the highest standard of efficiency. They were awarded a gold medal at the recent St. Louis Exposition.

MEETINGS

It is expected that there will be a large representation present at the meeting of the Brass Goods Association, to be held in New York Sept. 5-6 at the Hotel Imperial. The advance in the price of metals and the new relations of the manufacturer to the jobber will be considered.

At the convention of the Amalgamated Sheet Metal Workers' International Alliance, held recently at Washington, D. C., the report of the committee on the proposed alliance of the sheet metal workers and coppersmiths was not accepted and the subject is being held in abeyance by the Law Committee pending a more thorough investigation.

At a recent meeting of The Linton Brass Company, of Ogdensburg, N. Y., the following directors were elected, who in turn elected the following officers for the ensuing year: Directors: Edgar A. Newell, W. H. Linton, J. A. Woods, George W. Robinson and Albert P. Newell. Officers: Edgar A. Newell, president and treasurer; W. H. Linton, vice-president; J. A. Wood, secretary. The company are manufacturers of sash and drapery extension rods, pole ends, etc.

The Association of Master Copper Workers held a meeting in New York on August 24. The principal business transacted was the adoption of a new constitution and by-laws and a resolution declaring for better trade protection. The members believe that the continual purchasers of copper in large quantities are entitled to better rates than the occasional buyer. In the past five years the membership of the association has increased more than 30 per cent. The new members elected at this meeting were W. K. Wilson, New Orleans; George Keller, Evergreen, L. I., N. Y.; Klaussen & Link, Brooklyn, N. Y.; Duparquet, Huot & Moneuse Company, New York; Bramhall-Deane Company, New York, and S. Zietarski, Newark, N. J. After a very interesting meeting adjournment was made until next month.

PERSONAL

M. Goldberger, proprietor of the Fort Wayne Smelting and Refining Works, Fort Wayne, Ind., recently made a visit to New York, at which time he transacted considerable business.

A. N. Sperry, who has been for many years manager of the Sercomb Company, of Chicago, Ill., gold and silver platers, has retired from the plating business. He will be greatly missed, as he was considered an authority upon the subject of plating.

C. H. Greene, formerly of C. H. Greene & Co., of Syracuse, N. Y., manufacturers of the celebrated "Eureka" Snap Flasks and other sundry foundry supplies, has associated himself with the S. Obermayer Company, of Chicago, as superintendent of that department—namely, the manufacture of snap flasks, floor flasks, bench and floor rammers, etc.

METAL MARKET REVIEW

COPPER.—Speculation in London in Standard Copper has been very active, prices advanced rapidly when the exceedingly strong American market became fully known. Starting at £68 16s. 3d., Standard Copper advanced to £73 5s. on the 25th. The highest price quoted by the Metal Exchange was £72 15s. This advance brought out many sellers and the price broke about £2 per ton, closing at £70 12s. 6d. for short and £70 7s. 6d. for futures. Sales during the last three days amounted to 3,700 tons. Best Selected Copper opened at £73 and advanced to £78 5s., closing at £77.

The New York copper market during the month of August has been very active and excited. The advance of about 1½ cent has been altogether too rapid and sensational and consumers will naturally go very slow in face of the abnormally high prices and values will gradually get back again to a more normal basis. The heavy exports are over. China is not buying and is reported to be a seller of copper. The demand from the war has ceased and Japan will very soon be a factor in the copper markets of the world. The exports for the month of August amount to 21,420 tons, against 24,906 tons in August, 1904. The copper market for the time being is held very strong, and spot and early deliveries command a premium, but we do not believe this situation will hold indefinitely, and just so long as Lake and Electro is up around 17 cents just so long will consumers go slow and the inevitable will surely happen. We have seen 17c. copper before under the mistaken idea that consumers had to have it; they got along without it and the price broke to 11 cents; 17 cent copper is too high and we look for a lower and dull market in consequence. Lake and Electrolytic for spot more or less nominal 16¾ to 17 cents. October, November, December 16¼ to 16½, according to delivery; casting grades, 15¾ to 16 cents.

TIN.—The London market opened strong at £150 15s. and advanced to £151 15s. on the 2nd and then after a decline of about £3 prices again advanced to £152 15s. on the 25th, closing at £149 10s. Trading in London has been very heavy and within two days over 1,100 tons of futures have been sold.

There has been a fair business reported in the New York market. Consumption for the month, according to the Metal Exchange estimate, is 2,900 tons, against 3,200 tons last month and 3,600 tons during June. Prices have held around the London parity. Stocks in New York are comparatively small, and it is just possible we may see spot tin at a premium during September. The shipments for the month are reported heavy, 5,800 tons, and we should have lower prices. The market closes 5-10 ton lots spot tin 32¾, smaller lots 33 cents; September-October, 32½ to 32⅝.

LEAD.—London price opened at £13 17s. 6d. and advanced to £14 8s. 9d. at the close.

In the New York market the lead trust jumped the price $5 per ton, making New York shipment price $4.85 against previous quotation of $4.60.

TRADE NEWS

Trade News of Interest Desired from All of our Readers. Address THE METAL INDUSTRY, 61 Beekman St., New York.

SPELTER.—London market has been active and prices steadily advanced from £23 17s. 6d. on the first up to £25 15s. at the close.

The New York market for spelter has held very steady, prices advanced slightly earlier in the month, but at the close there is an easier tone to the market and prices after being marked up to 5.80 to 5.90 are to-day quotable at 5.70 to 5.75, according to delivery.

ANTIMONY.—The antimony market has been very erratic. Cookson's has sold up to nearly 18 cents and Hallitt's 14½ to 15 cents. With Japanese antimony probably coming on the market shortly we are likely to see again lower prices.

SILVER.—London price opened at 27¼d. and advanced to 28¾d. On the declaration of peace, silver, as well as all the other metals, declined, and pure broke 1d. in one day, closing at 28d., making a small advance for the month.

OLD METALS.—The market has been fairly active, all kinds of old copper were in demand and dealers have probably come out ahead in their stocks of old copper. Zinc dross is in demand and the price has been firm at from £88 to £92 a ton.

TRADE WANTS

ANSWERS SENT IN OUR CARE WILL BE FORWARDED.

POSITION WANTED by a foreman who has had charge of three different departments in a large brass manufacturing company; 35 years old, 18 years' experience and thoroughly acquainted with the manufacture of interchangeable brass work. Sober, reliable and capable of handling men. Address MANUFACTURING FOREMAN, care THE METAL INDUSTRY.

POSITION WANTED with reliable firm by a plater who is an expert on solutions and hustler on all colors. Understands silver deposit on glass and china. Address PLATER FOREMAN, care THE METAL INDUSTRY.

CASH PAID for old precious metals and minerals in any form. Gas mantle dust, bronze powder, bismuth, platinum, mercury, nickel, etc. Address JOSEF RADNAI, 284 Pearl street, New York City.

WANTED.—A first-class salesman well acquainted with the metal market. Fine opening for the right man. Address with full particulars MANUFACTURER, care THE METAL INDUSTRY.

WANTED.—Rotary slitting shears, power. J. W. SPENCE, Racine, Wis.

SILVERSMITH desires position as mounter. Experienced on church plate work. Address SILVERSMITH, care THE METAL INDUSTRY.

FOR SALE.—Three Hill barrels for recovering metal from brass ashes. First-class condition. Address HILL BARREL, care THE METAL INDUSTRY.

FOR SALE CHEAP.—46-inch Schwartz Melting Furnace. Address SCHWARTZ, care THE METAL INDUSTRY.

MOLD MAKER WANTED by the Continental Silver Company, Scottdale, Pa.

FOR SALE.—Brass Foundry in Chicago fully equipped and doing a good business. Address CHICAGO BRASS FOUNDRY, care THE METAL INDUSTRY.

WANTED—A working foreman for a small cast white metal plant. Should understand casting, polishing and plating. Salary to begin $21 per week. Address, with full particulars, WHITE METAL, care of THE METAL INDUSTRY.

WANTED—A THOROUGHLY PRACTICAL MAN on small cast white metal goods, with $1,00 or $2,000, can make a good connection with the advertiser. THE RIGHT MAN, NOT HIS MONEY, is wanted. Address WHITE METAL OPPORTUNITY, care of THE METAL INDUSTRY.

FOR SALE—A 20-inch diameter by 36-inch face, extra heavy rolling mill, all complete for rolling hot or cold metals. Also a complete annealing furnace. Address ROLLING MILL, care THE METAL INDUSTRY.

WANTED—TO RENT (MAY PURCHASE LATER), SMALL BRASS FOUNDRY AND MACHINE SHOP CONVENIENT TO NEW YORK. ADDRESS WITH FULL PARTICULARS G. W. KYBURG, P. O. BOX 237 NEW YORK, N. Y.

ROLLING MILL EQUIPMENT FOR SALE.—One stand, 16x32, and one stand 17x24 chilled rolls, with two sets driving gear, all complete. One 4 ft. by 8 ft. annealing furnace. One No. 4 Cincinnati geared squaring shear, 36 in. knife. One No. 205 Niagara circle and slitting shear. One heavy Farrell foundry slitting shear, slits 3-16 stock, in use only one year and practically new. Also 12x30 Corliss engine and boiler complete; used to drive above, and several other items, pickle and water tubs, etc., for use in rolling sheet silver, brass or kindred metals. Address ROLLING EQUIPMENT, care THE METAL INDUSTRY.

FOR SALE—Small aluminum factory. First-class equipment. Natural gas engine; costs about one cent an hour running. Hair pins, fur chains and small articles made. Never without orders. Machines practically new. Can teach purchaser to run business successfully in one month. Price, $1,500; $600 cash, balance on time to suit purchaser. A snap for a hustler. Poor health reason for selling. Address Aluminum Factory, care THE METAL INDUSTRY.

WANTED—A SALESMAN to sell crucibles in Chicago and vicinity. Address CRUCIBLE, care THE METAL INDUSTRY.

WANTED PLATER as foreman for a COLD GALVANIZING PLANT, capacity 10 tons per day. Must be thoroughly practical, competent to handle men and able to turn out large quantities of material. State age, experience, references and salary expected. Address A. B., 642 E. 23d st., Brooklyn, N. Y.

POSITION WANTED for SOFT SOLDERING on WHITE METALS or on BRASS. Have had 15 years' experience. Address SOLDERER, care THE METAL INDUSTRY.

WANTED—Machine for polishing tubing. Address MACHINERY, care THE METAL INDUSTRY.

POSITION desired as Foreman by a first-class Chandelier and Pattern Maker with 25 years' experience. I am well acquainted with modern antique work and finish. Address CHANDELIER FOREMAN, care THE METAL INDUSTRY.

MANUFACTURER'S AGENT—I desire to represent in Reading, Pa., and vicinity the manufacturers of metals, supplies and machinery for brass and iron foundries and factories. I have a wide acquaintance among the manufacturers of this section. Full particulars and references cheerfully furnished. H. E. HARBSTER, Reading, Pa.

A PARTY WITH $2,000 can learn of a good opportunity to enter the plating business in a shop which has been established six years in a good western city. Experience is more essential than money. Address, OPPORTUNITY, care of THE METAL INDUSTRY.

WANTED—A SALESMAN, who visits plating concerns, to sell a chemical as a side line. Address, with full particulars, HUSTLER, care THE METAL INDUSTRY.

WANTED—A FOREMAN in BRASS FOUNDRY. One familiar with mixtures and machine molding and competent to handle men properly; non-union. None others need apply. Address, with references, FOUNDRY FOREMAN, care THE METAL INDUSTRY.

INFORMATION BUREAU

Subscribers intending to purchase metals, machinery and supplies and desiring the names of the various manufacturers and sellers of these products can obtain the desired information by writing to THE METAL INDUSTRY. Our Information Bureau is for the purpose of answering questions of all kinds. Send for circular.

Metal Prices, September 7, 1905

METALS

	Price per lb.
Tin—Duty Free.	
Straits of Malacca	32.50
Copper, Pig, Bar and Ingot and Old Copper—Duty Free. Manufactured 2½c. per lb.	
Lake	17.00
Electrolytic	16.75
Casting	16.50
Spelter—Duty 1½c. per lb.	
Western	5.85
Lead—Duty Pigs, Bars and Old 2⅛c. per lb.; pipe and sheets 2½c. per lb.	
Pig Lead	4.90
Aluminum—Duty Crude, 8c. per lb. Plates, sheets, bars and rods 13c. per lb.	
Small lots	37.00
100 lb. lots	35.00
1,000 lb. lots	34.00
Ton lots	33.00
Antimony—Duty ¾c. per lb.	
Cooksons	15.00
Hallets	14.25
Other	13.50
Nickel—Duty 6c. per lb.	
Large lots	45 to 50
Small lots	50 to 75
Bismuth—Duty Free	$1.50 to $2.00
Phosphorus—Duty 18c. per lb.	
Large lots	45
Small lots	65 to 75
	Price per oz.
Silver—Duty Free—Commercial Bars	$0.61¼
Platinum—Duty Free	21.00
Gold—Duty Free	20.67
Quicksilver—Duty 7c. per lb. Price per Flask.	41.00

Zinc—Duty, Sheet, 2c. per lb. 600-lb. casks, 7.50 per lb., open, 8.00 per lb.

Tobin Bronze—Rods, Unfinished, 20c.

Tobin Bronze—Rods, Finished, 21c.

PRICE FOR ALUMINUM BRONZE INGOTS.

	Per pound.
2½ per cent	19c.
5 per cent	19½c.
7½ per cent	20½c.
10 per cent	21½c.

Manganese Bronze, Ingots	16 to 17c.
Phosphor Bronze, Ingots	16 to 20c.
Silicon-Copper, Ingots	32 to 36c.

OLD METALS

Heavy Cut Copper	14.25c.	16.00c.
Copper Wire	14.00c.	15.75c.
Light Copper	13.25c.	14.25c.
Heavy Mach. Comp	12.25c.	14.00c.
Heavy Brass	9.25c.	11.00c.
Light Brass	8.25c.	9.25c.
No. 1 Yellow Brass Turnings	8.25c.	9.75c.
No. 1 Comp. Turnings	10.75c.	12.25c.
Heavy Lead	4.35c.	4.50c.
Zinc Scrap	4.25c.	4.50c.
Scrap Aluminum, sheet, pure	22.00c.	25.00c.
Scrap Aluminum, cast, alloyed	12.00c.	18.00c.
Old Nickel	15.00c.	25.00c.
No. 1 Pewter	20.00c.	21.00c.

PRICES OF SHEET COPPER

SIZES OF SHEETS.		96oz. & over 75 lb. sheet 30x60 and heavier	64oz. to 96oz. 50 to 75 lb. sheet 30x60	32oz. to 64oz. 25 to 50 lb. sheet 30x60	24oz. to 32oz. 18¾ to 25 lb. sheet 30x60	16oz. to 24oz. 12½ to 18¾ lb. sheet 30x60	14oz. and 15oz. 11 to 12½ lb sheet 30x60
		CENTS PER POUND.					
Not wider than 30 ins.	Not longer than 72 ins.	21	21	21	21	21	22
	Longer than 72 ins. Not longer than 96 ins.	21	21	21	21	21	22
	Longer than 96 ins.	21	21	21	21	21	23
Wider than 30 ins. but not wider than 36 ins.	Not longer than 72 ins.	21	21	21	21	21	23
	Longer than 72 ins. Not longer than 96 ins.	21	21	21	21	21	23
	Longer than 96 ins. Not longer than 120 ins.	21	21	21	21	22	24
	Longer than 120 ins	21	21	21	22	23	
Wider than 36 ins. but not wider than 48 ins.	Not longer than 72 ins.	21	21	21	22	23	25
	Longer than 72 ins. Not longer than 96 ins.	21	21	21	22	24	26
	Longer than 96 ins. Not longer than 120 ins.	21	21	21	23	25	29
	Longer than 120 ins.	21	21	22	24	27	
Wider than 48 ins. but not wider than 60 ins.	Not longer than 72 ins.	21	21	21	22	24	27
	Longer than 72 ins. Not longer than 96 ins.	21	21	21	23	25	30
	Longer than 96 ins. Not longer than 120 ins.	21	21	22	24	27	
	Longer than 120 ins	22	22	23	25	29	
Wider than 60 ins. but not wider than 72 ins.	Not longer than 96 ins.	21	21	22	24	29	
	Longer than 96 ins. Not longer than 120 ins.	21	21	23	26	31	
	Longer than 120 ins.	22	22	24	29		
Wider than 72 ins. but not wider than 108 ins.	Not longer than 96 ins.	22	22	24	27		
	Longer than 96 ins. Not longer than 120 ins.	23	23	25	28		
	Longer than 120 ins.	24	24	26	30		
Wider than 108 ins.	Not longer than 132 ins.	25	25	27			
	Longer than 132 ins.	26	26	29			

Rolled Round Copper, ⅜ inch diameter or over, 21 cents per pound. (Cold Drawn, Square and Special Shapes, extra.)

Circles, Segments and Pattern Sheets three (3) cents per pound advance over prices of Sheet Copper required to cut them from.

All Cold or Hard Rolled Copper, 14 ounces per square foot and heavier, one (1) cent per pound over the foregoing prices.

All Cold or Hard Rolled Copper, lighter than 14 ounces per square foot, two (2) cents per pound over the foregoing prices.

Cold Rolled and Annealed Copper, Sheets and Circles, wider than 17 inches, take the same price as Cold or Hard Rolled Copper of corresponding dimensions and thickness

All Polished Copper, 20 inches wide and under, one (1) cent per pound advance over the price for Cold Rolled Copper.

All Polished Copper, over 20 inches wide, two (2) cents per pound advance over the price for Cold Rolled Copper.

Planished Copper, one (1) cent per pound more than Polished Copper.

Cold Rolled Copper prepared suitable for polishing, same prices and extras as Polished Copper.

Tinning Sheets, on one side, 2½c. per square foot.

For tinning both sides, double the above price.

For tinning the edge of sheets, one or both sides, price shall be the same as for tinning all of one side of the specified sheet.

Metal Prices, September 7, 1905

Net Cash Prices.

COPPER BOTTOMS, PITS AND FLATS.

14 oz. to square foot, and heavier, per lb. ..... 25c.
Lighter than 10 oz. ..... 31c.
10 oz. and up to 12 oz. ..... 28c.
12 oz. and up to 14 oz. to square foot, per lb. ..... 26c.
Circles less than 8 in. diam., 2c. per lb. additional.
Circles over 13 in. diam. are not classed as Copper Bottoms.
Polished Copper Bottoms and Flats, 1c. per lb. extra.

PRICE LIST FOR ROLL AND SHEET BRASS

Prices are for 100 lbs. or more of sheet metal in one order.
Brown & Sharpe's Gauge the Standard.

Common High Brass	in.	in.	in.	in.	in.	in.	in.	in.	in.	in.
Wider than and including	2 12	12 14	14 16	16 18	18 20	20 22	22 24	24 26	26 28	28 30
To No. 20 inclusive..	.22	.23	.25	.27	.29	.31	.33	.36	.39	.42
Nos. 21, 22, 23 and 24	.22	.24	.26	.28	.30	.32	.34	.37	.40	.43
Nos. 25 and 26.....	.23	.24½	.27	.29	.31	.33	.35	.38	.41	.44
Nos. 27 and 28.....	.23	.25	.28	.30	.32	.34	.36	.39	.42	.45

Add ½ cent per lb. additional for each number thinner than Nos. 28 to 38, inclusive.

Add 7 cents per lb. for sheets cut to particular lengths, not sawed, of proportionate width.

Add for polishing on one side, 40 cents per square foot; on both sides, double this price.

Brazing, Spinning and Spring Brass, 1 cent more than Common High Brass.

Extra Quality Brazing, Spinning and Spring Brass, 2 cents more than Common High Brass.

Low Brass, 4 cents per lb. more than Common High Brass.

Gilding, Rich Gold Medal and Bronze, 7 cents per lb. more than Common High Brass.

Discount from List, 30 per cent.

PRICE LIST FOR BRASS AND COPPER WIRE

BROWN & SHARPE'S GAUGE THE STANDARD.	Com. High Brass	Low Brass	Gilding Bronze and Copper
All Nos. to No. 10, Inc	$0.23	$0.27	$0.28
Above No. 10 to No. 16.....	.23½	.27½	.28½
Nos. 17 and 18.....	.24	.28	.29
" 19 and 20.....	.25	.29	.33
No. 21.....	.26	.30	.34
" 22.....	.27	.31	.35
" 23.....	.28	.32	.36
" 24.....	.30	.34	.38

Discount, Brass Wire, 30 per cent.; Copper Wire, 30 per cent.

PRICES FOR SEAMLESS BRASS TUBING.

From 1¼ in. to 3½ in. O. D. Nos. 4 to 13 Stubs Gauge, 20c. per lb.
Seamless Copper Tubing, 23c. per lb.
For other sizes see Manufacturers' List.

PRICES FOR SEAMLESS BRASS TUBING Iron Pipe Sizes.

Iron Pipe size.....	⅛	¼	⅜	½	¾	1	1¼	1½	2	2½	3	3½	4	4½	5	6
Price per lb.....	28	27	22	21	20	20	20	20	20	20	20	21	22	24	26	27

BRAZED BRASS TUBING

Brown & Sharpe's Gauge the Standard.

Plain	Round	Tube,	¾	in.	up	to	2	in.,	to	No.	19,	inc.	Per lb $0 35
"	"	"	⅞	"	"	"	84	"	"	"	19,	"	36
"	"	"	15	"	"	"	80	"	"	"	19,	"	38
"	"	"	⅝	"	"	"	78	"	"	"	19,	"	41
"	"	"	¾	"	"	"	76	"	"	"	19,	"	48
"	"	"	13	"	"	"	90	"	"	"	19,	"	65
"	"	"	¼	"	"	"	72	"	"	"	19,	"	1 00
"	"	"	⅛	"	"	"	70	"	"	"	19,	"	1 50
Smaller than ¼ inch.....													Special
¾ inch to 3 inch, to No. 19, inclusive.....													38
3 inch.....													40
Over 3 inch to 3¼ inch.....													45
Over 3¼ inch.....													50

Bronze and copper advance 3 cents. Discount 35 per cent.

PRICE LIST FOR SHEET ALUMINUM—B. & S. Gauge.

Wider than and including	3 in. 12 in. in coils.	6 in. 14 in.	14 in. 16 in.	16 in. 18 in.	18 in. 20 in.	20 in. 24 in.	24 in. 30 in.	30 in. 36 in.	36 in. 40 in	Cutting to Length.	Polishing or Satin Finishing One side.
No. 13	42	42	44	44	44	44	47	47	47	1	2
" 14	42	42	44	44	44	44	47	47	47	1	2
" 15	42	42	44	44	44	44	47	47	47	1	2
" 16	42	42	44	44	44	44	47	47	47	1	2
" 17	42	42	44	44	44	44	47	47	47	1	3
" 18	42	42	44	44	44	44	47	47	50	1	3
" 19	42	42	44	44	44	44	47	48	51	1	4
" 20	42	44	44	44	44	46	49	50	52	1	4
" 21	42	46	46	46	46	48	51	52	58	2	5
" 22	42	46	46	46	48	48	51	55	59	2	5
" 23	42	46	46	46	48	48	51	57	60	2	6
" 24	42	46	48	50	50	50	53	59	62	2	6
" 25	44	47	49	51	51	51	54	61	65	2	7
" 26	44	47	50	54	54	54	59	63	69	2	8
" 27	44	48	52	56	56	57	62	66	72	2	10
" 28	44	48	54	56	57	57	64	70	75	2	11
" 29	46	49	56	58	60	60	69	75	80	2	13
" 30	46	50	58	60	64	70	77	80	85	2	15
" 31	48	52	60	63	68	76	79	82	88	3	17
" 32	50	54	62	66	74	82	89	95	100	3	19
" 33	52	56	65	70	78	89	96	05	115	3	21
" 34	56	60	67	75	83	96	108	115	125	3	25
" 35	.....	70	75	85	95	105	120	130	.....	.....	Polished or Scratch Brushed 2 sides double above prices.
" 36	.....	85	95	105	120	125	140	.....	.....	.....	
" 37	.....	100	110	125	140	155	170	.....	.....	.....	
" 38	.....	120	135	150	165	180	200	.....	.....	.....	
" 39	.....	140	160	180	200	220	.....	.....	.....	.....	
" 40	.....	170	200	220	240	.....	.....	.....	.....	.....	

In flat rolled sheets the above prices refer to lengths between 2 and 8 feet. Prices furnished by the manufacturers for wider and narrower sheeet. All columns except the first refer to flat rolled sheet. Prices are for 50 lbs. or more at one time. Less quantities 5c. lb. extra. Charges made for boxing.

Discounts as Follows are Given for Sheet Orders Over 200 Pounds.

200 to 1,000 pounds..... 10 per cent. off list.
1,000 to 2,000 " 10 per cent. and 2 " "
2,000 to 4,000 " 10 " " 3 " "
4,000 pounds and over 10 " " 5 " "

PRICE LIST OF SEAMLESS ALUMINUM TUBING—STUBS' GAUGE.

STUBS' G.	1-4"	3-8"	1-2"	5-8"	3-4"	1"	1 1-2"	2"	2 1-2"	2 3-4"
4 to 11	.....	.....	96	86	83	77	67	61	61	61
12	.....	1 08	96	86	83	77	67	61	61	61
13	.....	1 08	96	86	83	77	67	64	64	64
14	.....	1 08	96	85	83	77	67	64	64	64
15	.....	1 12	96	89	86	80	70	67	67	67
16	.....	1 15	99	93	89	83	70	70	70	70
17	.....	1 18	1 02	96	93	86	73	73	73	73
18	1 85	1 24	1 05	99	93	86	77	77	77	80
19	1 88	1 28	1 08	1 02	99	93	83	80	80	83
20	1 95	1 31	1 15	1 08	1 05	99	89	86	86	89
21	2 01	1 37	1 21	1 15	1 12	1 05	99	93	93	96
22	2 17	1 44	1 24	1 18	1 15	1 08	1 05	99	1 05	1 05
23	2 33	1 50	1 31	1 24	1 21	1 15	1 15	1 08	1 15	1 15
24	2 48	1 60	1 37	1 31	1 28	1 18	1 21	1 21	1 24	.....
25	2 65	1 69	1 47	1 37	1 34	1 28	1 34	.....	.....	.....

Prices are for lots of 50 lbs. Boxing extra. Smaller, larger and intermediate sizes furnished by manufacturers.

Discounts as Follows are Given for Tube Orders Over 50 Pounds.

50 to 200 lbs..... 5 per cent. discount off list
200 to 2,000 lbs..... 10 " " " " "
2,000 to 4,000 lbs..... 10 and 3 " " " " "
4,000 lbs. and over..... 10 and 5 " " " " "

PRICE LIST FOR ALUMINUM ROD AND WIRE—B. & S. GAUGE.

Diameter B.& S.G'ge.	0000 to No. 10	No. 11.	No. 12.	No. 13.	No. 14.	No. 15.	No. 16.	No. 17.	No. 18.	No. 19.	No. 20.	No. 21.	No. 22.
Price per lb	$ 38	38½	38½	0 39	39½	0 40	40½	0 41	0 42	0 43	0 44	0 47	0 53

200 lbs. to 30,000 lbs., 3 cents off list; 30,000 lbs. and over, 4 cents off list.

PRICE LIST FOR GERMAN SILVER IN SHEETS AND ROLLS.

Per cent.	Price per lb.	Per cent.	Price per lb.
12.....	$0.52	16.....	.58
13.....	.53	17.....	.59
14.....	.54	18.....	.60
15.....	.55		

These prices are for sheets and rolls over 2 inches in width, to and including 8 inches in width and to No. 20, inclusive, American or Brown & Sharpe's Gauge. Prices are for 100 lbs. or more of one size and gauge in one order. Discount 50 per cent.